U.S. DEPARTMENT OF COMMERCE
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PB-284 095

Catalytic Control of NOx Demonstration

Gould, Inc, Cleveland, Ohio New Business Div

Prepared for

Environmental Protection Agency, Ann Arbor, Mich Emission Control Technology Div

Apr 77

PB 284 095

EPA-460/3-77-002
April 1977

CATALYTIC CONTROL OF NO_x DEMONSTRATION

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Mobile Source Air Pollution Control
Emission Control Technology Division
Ann Arbor, Michigan 48105

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TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO.
EPA-460/3-77-002

2.

3. RECIPIENT'S ACCESSION NO.
PB284095

4. TITLE AND SUBTITLE
Catalytic Control of NOx Demonstration Program,
Base Metal Catalyst Evaluation

5. REPORT DATE
February, 1977

6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)
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8. PERFORMING ORGANIZATION REPORT NO.

9. PERFORMING ORGANIZATION NAME AND ADDRESS
Gould Inc.,
New Business Division
540 East 105th Street
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10. PROGRAM ELEMENT NO.

11. CONTRACT/GRANT NO.
68-03-2161

12. SPONSORING AGENCY NAME AND ADDRESS
Environmental Protection Agency
2562 Plymouth Road
Ann Arbor, Michigan 48105

13. TYPE OF REPORT AND PERIOD COVERED

14. SPONSORING AGENCY CODE
200/05

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This report presents the results of a program that was intended to demonstrate the emission control benefits of catalytic reduction of NOx. The program objectives included the outfitting of three vehicles with catalytic systems and the accumulation of 50,000 miles of durability operation. The system selected was the Gould dual catalyst system. This system included a base metal (Ni-Cr alloy) reduction catalyst, a conventional noble metal oxidation catalyst, programmed secondary air injection, modified carburetion and revised spark timing. This system was installed in three 1975 Chevrolet Novas. Prior to the start of testing, it was discovered that the base metal catalyst formulation was susceptible to chemical attack and depletion by sulfur impurities present in typical pump gasoline. The program was held in abeyance while Gould attempted to develop a sulfur resistant formulation. Gould succeeded in developing a formulation with increased resistance to the sulfur impurities in fuel; however, a corresponding reduction in catalytic activity prevented the achievement of the 0.4 NOx emission level. The decision was then made to terminate the contract and prepare a final report which would present the work accomplished under the contract.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution Exhaust Emissions Catalysts Fuel Consumption Motor Vehicles Nitrogen Oxides	Base Metal Catalysts	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES 371
	20. SECURITY CLASS *(This page)*	22. PRICE A16 / MF A01

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CATALYTIC CONTROL OF NO_x DEMONSTRATION

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Ann Arbor, Michigan 48105

April 1977

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Publication No. EPA-460/3-77-002

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FOR
THE FINAL REPORT
OF
U. S. EPA CONTRACT 68-03-2161

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SUMMARY

The contract had as its primary purpose the demonstration and evaluation of a catalytic device to control NOx emissions. Additionally, it was expected to generate data that would permit identification of areas needing further development.

Vehicles were chosen that were considered typical of those that would be prevalent in the short term future and were consistent with the requirements specified in the contract scope of work. These vehicles, 1975 Chevrolet were acquired and were fitted with a dual-bed catalyst system. This system featured a catalyst known as GEM 68 that incorporated a unique means of oxygen control known as an "oxygen getter". The majority of emphasis to the ensuing program was directed at calibrating the system for minimum fuel consumption and gaseous emission rates.

Aside from the normal changes of carburetion, advanced components were examined in an effort to further benefit the catalyst system. These components included backpressure exhaust gas recirculation (EGR) valves, high capacity air pumps, and exhaust port liners.

The primary effort of this contract was intended to be the durability testing of the GEM 68 reduction catalyst, however, this durability demonstration was not conducted due to the incompatibility of the GEM 68 catalyst with fuel containing the national average level of sulfur (300 PPM). A new version of the catalyst designed to be sulfur resistant has not been fully developed to date. Due to the uncertainty of success of this development effort and the shortage of manpower caused by the demands of the sulfur tolerant catalyst development effort it was jointly decided to terminate the contract.

In the event that low sulfur (less than 50 PPM) fuel had been nationally available, the durability emission control system would probably have included a modified Quadrajet dual-diaphragm EGR, timed air injection utilizing a standard 19 CID air pump, the Gould GEM 68 reduction catalyst and Englehard PTX-II-C oxidation catalysts. The backpressure EGR valves were precluded from use on the vehicles due to their sensitivity to exhaust system backpressure. The backpressure changes experienced were a result of catalyst degradation caused by high fuel sulfur exposure and would not be typical of currently produced vehicles. The high capacity air pumps were not included in the final system configuration as no benefit in emission control was experienced with the dual-bed system. Careful evaluation of the port liners showed that, when used in conjunction with exterior manifold insulation, advantages in catalytic efficiencies may be expected if marginal operating temperatures were prevalent before their application.

Final calibration resulted in initial system performance that was lower than statutory HC and CO limits of 0.25 and 2.11 g/km (0.41 g/mile and 3.4 g/mile) but exceeded the 0.25 g/km (0.4 g/mile) NOx emission rate. This was a result, in part, of the fuel sulfur exposure and low exhaust gas temperatures exhibited by the vehicle. To comply with the statutory NOx emission rate would result in an increase in fuel consumption using conventional technology. Through the application of concepts such as port liners, preliminary investigations indicate that lower fuel consumption could potentially be achieved at equivalent emission rates.

HISTORY OF CONTRACT

At the time of the RFP for this contract in August, 1974, Gould prepared a detailed proposal to demonstrate and evaluate an emission control system employing a unique catalyst for NOx control. Due to the complex interaction between emission control, fuel economy, and vehicle performance, it was recognized that considerable expertise was required to successfully implement a catalytic device on vehicles. Gould, through its ongoing programs in catalyst research, dynamometer characterization studies, and vehicle test fleet, appeared well qualified for the task.

In April, 1975, Gould was awarded the contract. As detailed in the proposal, vehicles conforming to the specifications listed in the RFP were selected and authorization to purchase them was received from the Project Officer. Prior to vehicle delivery, an engineering plan was detailed to evaluate the variables of carburetion, exhaust gas temperature, ignition spark timing, etc. to enable the development of a complete system.

Shortly thereafter, filter analysis data were received from the EPA. This data concerned the results of sulfate and particulate emission tests that were performed on one of Gould's dual-bed vehicles in late 1974 at the EPA Motor Vehicle Emission Laboratory.

At the time of the tests, a fuel containing a known quantity of sulfur, 0.03 wt %, was used to establish a sulfur to sulfate conversion level. To accomplish this, particulate filters were positioned in the diluted exhaust gas stream of the constant volume sample sulfate tunnel and an isokinetic sampling of the exhaust gas was obtained.

The sulfate analysis, performed in Ann Arbor, showed relatively low sulfate conversion levels; that is, on the order of 10% conversion. Further analysis of the filters for remaining particulate analysis was scheduled to take place at the EPA Research Triangle Park Facility in Durham, North Carolina. These analyses, as complex as they are, required until February, 1975, to complete. As data became known, metal emission rates were found to be considerably higher than could be explained on the basis of Gould's in-house tests.

In subsequent attempts to determine the cause of the high emission rate, controlled laboratory tests and metallurgical analyses indicated that the fuel sulfur, oxidized in the combustion process to SO_2, was attacking the grain boundaries of the nickel based GEM 68 alloy. Ensuing deterioration in the grain boundaries allowed the relatively large grains to become dislodged and removed by the engine exhaust gas flow.

This phenomenon had not been recognized in previous testing at Gould due to the fact that the gasoline supply used for vehicle testing was exclusively supplied by the American Oil Company. The gasoline used, AMOCO "Super Premium", was at that time the only commercial fuel in Cleveland available in an unleaded version conforming to the 1975 lead and phosphorous requirements for certification durability test fuel. By virtue of low sulfur feedstocks and the sophisticated refining technique used to achieve its high octane, the sulfur level in the "Super Premium" was typically less than 0.005 wt % (50 PPM). Through dilution of the internal combustion engine processes, SO_2 concentration in the exhaust gas was $\sim$4 PPM at a 14/1 air/fuel ratio. Comparatively, SO_2 concentrations in the exhaust gas of a vehicle using 0.03 wt % sulfur fuel is $\sim$21 PPM at a 14/1 air/fuel ratio.

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Internal test programs were established to fully characterize the effect of SO_2 concentration on GEM 68 durability and efficiency. In addition, a massive internal effort aimed at corroborating the failure mechanism was initiated with the intent to develop a sulfur resistant catalyst. This program had as its targets a total metallic particulate rate of no more than 0.3 mg/km (0.5 mg/mile) with a 1975 FTP conversion efficiency of at least 50%.* After these programs were established, work was begun on baseline testing and initial modification of the three contract vehicles which were delivered in June, 1975. Since all calibration and emission testing was to be performed on fuel conforming to the Federal Register specifications, the fuel sulfur effect was minimized in that Indolene CLEAR has a fuel sulfur level of less than 100 PPM. This results in less than 7 PPM SO_2 in the exhaust gas at a 14/1 air/fuel ratio.

As the construction and calibration phases were continuing, discussions with the EPA Project Officer established that a 0.03 wt % sulfur level was a reasonable expectation of what the average fuel sulfur level is, and would continue to be in future unleaded gasoline pools.

Discussions with the Project Officer then centered on what fuel would be used for the durability portion of the demonstration. Since, at that time, the effect of fuel sulfur with regard to extended mileage was unknown, it was felt that all vehicles should not use 0.03 wt % sulfur fuel. It was also considered important that two vehicles accumulate mileage in near identical fashion to provide for a back-up in the event of a vehicle mishap or system malfunction. With this in mind, Gould agreed to durability test one vehicle with 0.03 wt % sulfur fuel.

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*These programs were financed entirely through Gould's own resources.

Work was continued on the calibration and optimization phases of the contract with GEM 68 knowing that any new sulfur resistant catalyst developed from the internal effort would closely resemble the operating characteristics of GEM 68. As work progressed on the sulfur resistant catalyst, a full characterization of the effect of sulfur on GEM 68 was completed. The data indicated that GEM 68 was not compatible with 0.03 wt % fuel sulfur levels and the decision to test GEM 68 with this fuel was changed.

In a meeting with the EPA Project Officer in March, 1976, it was formally agreed to suspend all contractual efforts on GEM 68. This decision was based upon the promising initial performance of GEM 69 with respect to fuel sulfur resistance. The suspension was enacted with the intent to redirect the contract to the demonstration of GEM 69 after full internal development and evaluation. This suspension also provided additional manpower for the sulfur resistant development effort.

Vehicle evaluation continued on new versions of the catalyst until September, 1976, when it became apparent that a fully developed sulfur resistant catalyst would not be imminent. Furthermore, the need for an extended laboratory research effort was recognized.

Since, at that time, Gould had no forthcoming candidate catalyst for the durability phase of the contract and could not accurately forecast the availability of a sulfur resistant catalyst, it was recommended by Gould that the contract be terminated.

Based on these factors, contract termination was sought and work began on completion of the final report that was to include all data generated during the period of performance.

PHASE I - VEHICLE SELECTION, PROCUREMENT, AND INITIAL TESTING

Three nominally identical vehicles were selected for the purposes of modification and testing a dual-bed catalyst system. To comply with the scope of work, the vehicle type was to be a five to six passenger domestic sedan in the 3,000 to 4,000 inertia weight range. In addition, it was felt that a V-8 engine was more desirable than a straight four or six cylinder engine in that two catalysts could be tested on a vehicle. This effectively doubles the durability data base and provides for additional chances of continued testing in the event of an engine or system malfunction.

Further consideration was given to other factors such as:

1) fuel economy comparisons published by EPA
2) available space for catalyst placement
3) vehicle cost
4) quality of carburetor control
5) vehicle availability

After examining compact and intermediate sized vehicles, it was felt that 1975 Chevrolet Novas equipped with 350 CID engines, California emission controls, and automatic transmissions would fulfill the specifications.

Initially, the vehicles were ordered from the factory to assure their similarity and ready availability. However, delays in the factory order procedure and uncertainties regarding assembly date and delivery prompted efforts to locate three similarly equipped Chevrolet Novas already on dealer lots. Three vehicles were located at various dealerships in California and transported to Cleveland via car carrier.

The vehicles, differing slightly in cosmetic packages, each had an LM-1 350 CID V-8 engine and automatic transmission. The California emission control system included a single-diaphragm EGR valve, an air pump with associated check valves and plumbing, and a 260 cubic inch pelleted underfloor oxidation catalyst. Additional changes to the vehicles since 1974 included recalibrated carburetors, more advanced spark timing curves, and High Energy Ignition (HEI) systems. Vehicle identification and in-house designations were established as shown in TABLE I-1.

The vehicles were inspected and all adjustments were set to factory specifications. Primarily, this consisted of adjustments to the carburetor idle mixture, idle speed, and initial spark timing. As suggested in the basic proposal, the vehicles were then driven on a road course that closely corresponded to the Federal Durability Driving Schedule without the idle stops for ∿2,600 miles to stabilize the engine and its emissions. Other than stabilization, other benefits included a chance to find obvious problems with the vehicles and more closely approximated the procedures called for in certification testing a 4,000 mile data car.

Reference to the schedule is found in Appendix IV, Durability Driving Schedule, in the Federal Register, Thursday, June 28, 1973, Volume 38 - Number 124, Part III, Page 24319. FIGURE I-1 is a map of the actual road course as established on public roads east of Cleveland. A detailed directional listing of the road course is provided as Appendix I.

The mileage accumulation proceeded without any complications and fuel consumption during this time was found to be as shown in TABLE I-2. Inspection of the vehicles showed no obvious problems and the vehicles were prepped for baseline emissions and fuel consumption tests. Although vehicle 26 exhibited a higher rate of fuel consumption, no single factor was identified as being responsible. Centrifugal and vacuum advance curves of the three distributors were checked and found to conform to specifications listed in the applicable factory service manual. The centrifugal and vacuum advance curves can be found in FIGURES I-2 and I-3, respectively. Testing of the EGR valves showed their initial opening, full opening, and closing vacuum levels to be similar and within the limits found in the service manual. The rear axle ratios of the vehicles were all found to be 3.08/1 and transmission operation did not indicate any problems, i.e., slippage. Thus, it was concluded that the variations in fuel consumption were caused by normal vehicle and driver variances.

Tests to establish baseline emissions and fuel consumption were then performed. These tests consisted of three 1975 Federal Test Procedure - Constant Volume Sample (CVS) tests and three Highway Fuel Economy tests All tests were performed in accordance with Federal Register rules and regulations governing the test methods. In addition to the carbon balance method of determining fuel consumption, a fuel flowmeter was utilized to determine actual fuel usage by a volumetric method.

A summary of the test results on the three vehicles, along with the published EPA certification data (4,000 mile data x deterioration factor) for this engine/inertia weight/axle ratio combination, are shown in TABLE I-3. This table shows that the three test vehicles exhibited similar levels of fuel consumption and gaseous emissions. A listing of each individual test is provided in TABLE I-4.

Advanced Hardware

During this phase of the demonstration, attention was focused on individual advanced components to determine if they could be successfully incorporated into the dual-bed system. Such items as backpressure modulated exhaust gas recirculation (EGR) valves, large capacity (22 CID) air pumps, and advanced oxidation catalysts were examined.

In an effort to evaluate advanced oxidation catalysts with proven 50,000 mile durability and superior efficiency, major independent catalyst suppliers were contacted and asked to recommend a catalyst that would be best suited for this application.

Matthey Bishop suggested that their best catalyst for extended HC control was a catalyst designated 20G. This catalyst incorporates a more durable substrate, a better washcoat, and improved metallic particle dispersion. However, because 50,000 mile durability testing was just commencing and no extended durability data was available, samples were sent for evaluation. Due to the lengthy and costly nature of durability testing and the fact that this catalyst had no proven 50,000 mile durability, it was decided to forego this catalyst as a candidate for the dual-bed system and, therefore, no evaluation was conducted.

Universal Oil Products recommended that two 1975 platinum/palladium production catalysts be used per vehicle and this configuration had demonstrated satisfactory hydrocarbon control over 50,000 miles. As related during phone conversations, engine dynamometer data after 50,000 miles using one 1975 oval oxidation catalyst per bank of a V-8 engine gave a range of 34 to 88% HC conversion (average 74%) and 35 to 82% CO conversion (average 64%). These data were the result of six tests and the reason for the large scatter in efficiency was not made evident. Due to this scatter and the substantial space requirements necessary to fit two of these large oval catalysts on the vehicle, the catalyst was eliminated from consideration.

Englehard Industries recommended a catalyst designated PTX II-C as the most likely to satisfy the requirements set forth. Details such as loading factor, washcoat information, and durability data were not made available, however, it was characterized as a platinum/palladium catalyst on an improved Corning substrate. Ford catalyst fleet durability data (Fleet A and B) on PTX II-C oxidation catalysts showed superior HC efficiency at 50,000 miles when compared to the production PTX II-B. Therefore, with the Project Officer's approval, it was decided to utilize the PTX II-C catalyst for the demonstration.

Other items that were procured for evaluation included adjustable backpressure modulated EGR valves, large capacity 22 CID air pumps, and exhaust port liners.

PHASE II - VEHICLE MODIFICATION

Modification of the first vehicle, ETV 24, began with the removal of the exhaust manifolds, exhaust system, oxidation catalyst, and air injection system. The stock manifolds were replaced with 1973 production nodular iron manifolds, part numbers 346222 and 364753, that had provisions in the castings for port air injection. The fact that nodular iron has superior thermal shock and fatigue characteristics was considered an additional benefit, although no problems had been previously encountered when using cast iron manifolds. A photograph of a manifold with installed air injectors can be seen in FIGURE II-1.

To aid in installation and prevent complex pipe fabrication, the transmission crossmember was changed. A crossmember from a 1973 Chevrolet Impala was installed in place of the standard unit, photographs of which are included as FIGURE II-2. In addition, the transmission control rod was modified as shown in FIGURE II-3 to allow the catalyst assemblies to be closer to the vehicle floor pan. This increased ground clearance to an acceptable level on the driver side of the vehicle. Using the exhaust manifold flanges from the standard head pipe, standardized NOx canisters, engineering drawings of which are included as FIGURES II-4 through II-8, were attached in such a way as to insure closeness to the exhaust manifold, avoid severe inlet angles to the canister, and provide for adequate ground clearance.

The Englehard oxidation catalysts were then attached to the exit cones of the NOx canisters. The oxidation catalysts were slightly modified in that an air distribution tube, shown in FIGURE II-9, was installed in the inlet bell. Aside from providing adequate air injection and mixing with the exhaust gas, this tube also provided for uniform flow distribution throughout the oxidation catalyst. FIGURES II-10 and II-11 show a completed catalyst segment, both in assembled and exploded fashion. Details such as thermocouple locations and exhaust gas sampling taps are easily identifiable.

The remainder of the exhaust system consisted of a Y-pipe leading into an OEM muffler. This rearmost portion of the exhaust system was not modified except for the addition of flanges on the ends of the tailpipes to accommodate the Constant Volume Sampler for emissions and fuel consumption testing.

In anticipation of testing different size NOx catalysts, the system was fabricated to accommodate both four inch and five inch NOx canisters. Evaluation of a larger catalyst was prompted by the realization that lower exhaust gas termperatures and other contributory factors would decrease the expected efficiency of a standard four inch catalyst; some of this decrease in efficiency was expected to be recovered by taking advantage of catalyst sizing characteristics. It was also recognized that a trade-off between catalyst efficiency and optimum heat-up rate would become apparent and the fabrication of the systems was planned to allow for ease of removal and installation during comparative testing.

A photograph of a 4" diameter system installed on the vehicle is shown in FIGURE II-12. Marman type flanges and connectors were placed at locations to provide convenient assembly and disassembly of the system. Exhaust gas sample taps, thermocouple taps, and the air injection supply line can be seen in the photograph. FIGURE II-13 is a close-up view of the driver side installation.

To accommodate feedgas level determination, a dummy system was fabricated that could replace the reduction and oxidation catalysts. After fabrication, the actual catalyst packages, as assembled in FIGURE II-10, were flow tested at 100 SCFM on a flow bench to determine the pressure drop (ΔP). This ΔP was then simulated in the dummy pipe with a perforated plate to provide for equivalent backpressure in the exhaust system. This configuration, shown installed in FIGURE II-14, insured minimal carburetion calibration changes and near equivalent backpressures on the engine while determining feedgas levels. A view of the canisters off the vehicle can be seen in FIGURE II-15.

Underhood modification began with the installation of air supply lines from the air pump to the oxidation catalyst and to the port air distribution tubes. Standard GM checkvalves were used in each line to protect the air pump. The diverter valve assembly on the pump was removed and replaced with a "Tee" fitting to allow routing of the one-half inch air lines to each side of the engine.

As shown in FIGURE II-16, in parallel with the air line to the oxidation catalyst is a timer controlled solenoid which regulates the flow of air to the exhaust ports. A temperature sensor was added to the control system to prevent solenoid operation when engine coolant temperature is in excess of 160° F. Although the timer is reset every time the vehicle started, continuity must exist in the temperature sensor for the solenoids to activate. FIGURE II-17 is an electrical diagram of the circuits involved.

Provisions were also made on the vehicle for a time controlled ignition retard. Primarily, this subsystem disallowed vacuum to the advance mechanism of the distributor, thereby effectively retarding the ignition timing. Incorporated into the system at a later date was an override system which consisted of a vacuum controlled switch. In the event that manifold vacuum dropped below a predetermined level, this switch would allow vacuum to the distributor advance mechanism. Experience gained during testing had shown that this override enabled more consistent cold starts and lower engine out emission during the critical periods of initial catalyst warm-up.

Replacement electric chokes, recently released by GM Delco Division, were used on one of the vehicles. A discussion of the data takes place in another section of the report. The standard oil pressure sending unit on ETV 24 was replaced with a Cadillac unit, part number 646144, that also prevented voltage to the choke when the engine was not running. This switch provided a safeguard against premature choke operation in the event that the ignition switch was left in the ON position when the engine was not running.

In addition to these changes, the Early Fuel Evaporation (EFE) system on the vehicle was disabled during the course of the testing. This system essentially restricted the flow of exhaust gas through the passenger side exhaust pipe until engine temperature reaches 160° F forcing the exhaust gas through the intake manifold crossover and providing for faster heating of the carburetor and intake manifold. This reduces the time required to reach operating temperature and thereby helps to stabilize emissions and improve cold engine operation. However, the technique presently used to rapidly heat the NOx catalyst system consists, in part, of utilizing the oxidizing characteristics of the getter and NOx catalysts: By the oxidation of certain exhaust gas constituents during choked operation, a significant amount of heat is evolved

(~38° C/1% oxidized CO and 43° C/1000 PPM HC as C) for this particular vehicle. Since diverting the exhaust gas from one of the catalysts would significantly lengthen the time required for that catalyst to reach operating temperature, the valve was left in an opened position and the actuating diaphragm was removed from the vehicle.

FIGURES II-18 and II-19 show the underhood compartment after modification. In FIGURE II-18, the manifold vacuum sensing device is indicated by letter "A" along with the vacuum solenoid "B". The port air solenoid, letter "C", is shown mounted on the inner fender panel with one-half inch line connections to the port air injection manifold, letter "D".

A resistor which is to reduce choke voltage and vary choke time is identified by letter "A" in FIGURE II-19 along with the electric choke, letter "B". The temperature sensor, referenced as letter "C", is shown in its holder.

PHASE III - VEHICLE CALIBRATION/OPTIMIZATION

Carburetion - General

The initial objective of this Phase was to modify the carburetion on the vehicle to provide for richer-than-stoichiometric operation under all operating conditions. Previous experience with similar vehicles had shown that the most difficult area of air/fuel control was transient operation, i.e., acceleration. Second in difficulty was part-throttle operation. In dealing with the transient response characteristics of the carburetor (FIGURE III-1), such things as accelerator pumps, power valves (in the case of the GM Quadrajet, the power valve is incorporated into the metering rod assembly), PCV bleeds, and evaporative emission canister bleeds could be altered to minimize lean (greater than 14.7/1) transients. In richening the air/fuel mixture during part-throttle operations, changes to air bleeds, metering rods, pick-up tubes, and channel restrictors are necessary. Although previous experience dictated certain changes, the final configuration must be arrived at through trial and error procedures.

In general, the procedure used consists of adjusting the carburetor idle mixture screws to obtain 1.5% CO. The vehicle is then driven at steady-state speeds up to 60 MPH to obtain air/fuel ratios versus speed measurements. Typically, the mixture needs to be richened at these speeds to achieve the desired 1.5% CO, so an iterative process of enlarging the main circuit jets and the part-throttle (off-idle) circuit metering orifices follows where the respective orifices are gradually enlarged. Since the part-throttle circuit affects the air/fuel ratio at higher speeds when the main circuit is dominant, the effect must be considered when enlarging the main circuit jets.

Ultimately, the air/fuel ratios at the various steady-state speeds fall into the specified range of 1.25 to 1.75% CO. At that point, transient carburetor responses are monitored while operating the vehicle through various test schedules on the chassis dynamometer. Changes to the accessory circuits such as the power valve and acceleration pump provide for the elimination of lean air/fuel ratio excursions and the minimization of extremely rich air/fuel ratio excursions. These changes can consist of changing the accelerator pump actuation, stroke, nozzle diameter, power valve orifice, and actuation vacuum.

Cold Start Techniques - General

At the completion of warm operation calibration and after system variables such as timing, EGR rates, etc. have been established, calibration for cold start operation is accomplished by monitoring engine out levels of CO and O_2 at the oxygen getter inlet. Primarily, initial choke opening, cold idle speed, and choke time are varied to yield a 4 to 5% CO concentration at the getter inlet. As the choke releases over the next 120 seconds, the CO concentration of the exhaust gas also decreases.

The rich exhaust gas is mixed with oxygen in the exhaust ports to allow oxidation to occur. The heat evolved in the reaction serves to heat the catalyst system.

Further augmenting the catalyst heat up rates, the remaining 4 to 5% CO in the exhaust gas enters the oxygen getter with ∿2.5% free oxygen remaining. This allows further oxidation to take place in the oxygen getter and NOx catalysts thus further decreasing the time required to reach operating temperatures.

Further, heat for catalyst warm-up is provided by a 45 second ignition timing retard and a cold neutral idle speed of 1600 RPM. These figures, established through previous experience, appeared to be reasonable with respect to fuel consumption, driveability, engine stalling, and heat released and were applied to the test vehicles.

Carburetion - Quadrajet

In the case of the Quadrajet carburetor, the first step in the modification consisted of placing a 1.6 MM orifice in the Positive Crankcase Ventilation (PCV) line to limit the volume of air flow and help reduce free oxygen in the exhaust caused by mixture maldistribution in the intake manifold during vehicle operation. After adjusting the idle CO to a nominal 1.5% CO, the main jets and/or metering rods were replaced with different sizes to evaluate their effect on the air/fuel ratio at higher vehicle speeds. One important change is that the new rods, manufactured in a machine shop, were of constant diameter. This eliminated the drastic change in the diameter of the original stepped rods which seemed to cause significant air/fuel ratio changes. During the course of this evaluation, the channel restrictors (FIGURE III-1, letter "A") were gradually increased in size to effect a richer part-throttle mixture (the channel restrictors function as metering orifices for the off-idle system). As the mixture ratio approaches that of 14/1, final adjustment is made through the use of the adjustable part-throttle aneroid (FIGURE III-1, letter "B").

The aneroid in the California carburetor, part number 17052235, attempts to compensate for changes in atomspheric pressure through the use of a sealed bellows section in addition to serving as a limited part-throttle mixture adjustment. This section responds to pressure changes and then reacts to withdraw (or insert) a metering rod from a fixed orifice. Extensive chassis dynamometer testing showed that the bellows aneroid was extremely sensitive to underhood temperatures. This sensitivity, exaggerated by dynamometer testing, caused instability in air/fuel ratio control to the point where constant control at steady-state speeds was unattainable. To relieve the problem, attempts were made to fit a rod assembly, part number 17053049, from a 49-state carburetor which does not use the pressure compensating bellows. However, the assemblies were not interchangeable due to different rod sizes. A photograph of both assemblies is shown in FIGURE III-2. Therefore, complete 49-state carburetors, part number 7045202, were fitted to the vehicles and the calibration procedure was continued.

The final specifications for all three vehicles varied slightly due to engine and components variability. A list of the final specifications is provided in TABLE III-1.

The results of these changes can be seen in FIGURE III-3 which compares the exhaust gas constituents from the unmodified carburetor to those obtained from the carburetor after effecting the internal changes previously noted. Although the air/fuel ratio is dependent on, among other things, ambient air temperature, the OE air cleaner minimizes the temperature change by mixing hot and cold air in the snorkel. This system was left intact so that carburetor air inlet temperature fluctuations were reduced.

Backpressure EGR Valves

With carburetor calibration completed, optimization of the system to maximize catalyst efficiency and reduce fuel consumption was started. The first step in the optimization phase was to characterize the effect of the backpressure EGR valves on feedgas emission levels and fuel consumption. This was accomplished by using canisters whose backpressures were equivalent to those containing catalysts. The evaluation included various recycle rates, control spring rates, and spark timing schedules. All tests were performed on the same vehicle to eliminate vehicle-to-vehicle variability problems. In an effort to develop the data base without a significant time delay, it was felt that the hot transient bag (BAG 3) of a 1975 FTP test would clearly represent the test trends and, therefore, be fully applicable to the standard test. After conclusions were drawn from the data, full scale confirmatory testing was planned.

Three prototype adjustable backpressure EGR valves were supplied by the EPA. The first series of tests were performed to evaluate the differences caused by varying outer control spring tension. This spring tension regulates initial opening and closing of the orifice in addition to movement of the valve during operation after the exhaust backpressure exceeds the inner control spring tension. FIGURE III-4 is a cross-sectional view of the backpressure valve while photographs of assembled and exploded valves are shown in FIGURES III-5 and III-6, respectively.

TABLE III-2 illustrates the effect of three outer spring tensions with constant orifice size. Comparing the data to hot transient (BAG 3) baseline data indicates that slightly lower (2%) fuel consumption was possible with a 22% reduction in NOx emissions. Undoubtedly, some of the NOx reduction is due to the richened air/fuel ratio; however, it is interesting to note that fuel consumption was not adversely affected.

Spark Advance

In an attempt to further lower fuel consumption, tests were performed using a 1970 Chevrolet distributor, part number 1112042. Previous experience with this breaker point distributor on other vehicles indicated that the advance curve was well suited for lower emissions and fuel consumption. The effect of the advance curve, in addition to that of the HEI ignition system, is seen in TABLE III-3. The data clearly show that, although fuel consumption and NOx emissions are lower with the 1970 distributor, hydrocarbon emissions increased to a level where current catalyst technology could not enable the vehicle to comply with a 0.25 g/km emission rate. Additional tests to verify this conclusion were performed while varying EGR recycle rate (orifice size). The results confirmed that greater recycle rates reduced NOx emissions but increased hydrocarbon emissions to an unacceptable level when used with the 1970 distributor and ignition system.

Further characterization of the EGR valves with the HEI system was continued using supplied hardware and a table detailing the test results is provided as TABLE III-4. The data is classed according to relative degree of spark advance for constant EGR orifice sizes. In some cases, third bag data is taken from cold and hot start 1975 FTP tests. A graphic representation of a portion of the data is shown in FIGURE III-7. As seen, NOx emissions decreased with increasing orifice size while hydrocarbon emissions remained relatively stable. Fuel consumption measurements indicated that certian configurations provided for a decline in consumption. Examining the performance of these configurations during the cold stabilized bag (BAG 2) of 1975 FTP emission tests showed decreasing NOx emissions with increasing recycle rate.

Hydrocarbon emissions did not increase significantly until recycle rate reached excessive amounts. These data are shown in TABLE III-5.

In drawing conclusions from these tests, Gould felt that further spark timing advance did not lower fuel consumption to the point where the concurrent increase in hydrocarbon emissions, both short and long term, could be justified. Additionally, the degree of octane requirement increase (ORI) exhibited by the engine during mileage accumulation could only be worsened by further increases in spark advance. Therefore, these considerations led to the conclusion that additional spark timing could not be implemented.

In the case of retarded timing which, in effect, was evaluated through the use of ported vacuum advance, it was felt that any increase in fuel consumption was not justifiable in terms of the extra temperature generated in the exhaust gas. It was felt that the effect of the low exhaust temperature could be adequately offset through selection of an optimum size catalyst. For these reasons then, the timing was left at factory specifications.

Catalyst Sizing Experiments

Comparing the exhaust gas temperatures and the NOx emissions of these engines to previously tested models showed that these parameters reached lower levels than expected. In correlating this information with catalyst laboratory data, it was indicated that the conversion efficiencies of a four inch catalyst system might not be sufficient to comply with a 0.25 g/km NOx level without seriously compromising fuel consumption.

As seen in FIGURE III , the gross NOx light-off temperature for the given test conditions is near 400° C. This low temperature was occasionally encountered in the exhaust of the vehicle during idle periods and would not enable efficient NOx conversion if the catalysts were allowed to reach these temperatures. This is due to the fact that conversion efficiency is a function of temperature. At this temperature, an increase in unreacted NOx and excessive ammonia formation would result. This low temperature during idle was the reason for testing with a ported vacuum advance in the characterization tests as the effective retard is significant (15 to 20°).

Further complicating the selection is the fact that the GEM 68 catalyst appears sensitive to inlet NOx levels. FIGURE III-9 illustrates the trend of decreasing net NOx conversion with decreasing inlet NOx levels; all other conditions remaining constant. At the temperature levels that the vehicles operate, the efficiency is believed to decrease even more.

These particular characteristics can be offset, however, by increasing the catalyst size which effectively decreases space and linear gas velocities. FIGURE III-10 illustrates the general effect of lowered space velocities on NH_3 formation and gross/net NOx conversion. As evidenced in the graph, some conversion gains can be expected. However, due to the substantial increase (70%) in catalyst mass, the heat-up rate was expected to be slower than a conventional four inch system.

To determine the magnitude of the thermal mass effect and generate conversion efficiency data for the five inch system, a five inch catalyst system consisting of two five inch GEM 68 NOx reduction catalysts and two Englehard PTX II-C oxidation catalysts were installed on the test vehicle. Initial tests were performed to calibrate the choke and to evaluate different recycle rates on the EGR valve. Primarily, choke time and initial opening were varied to arrive at an initial choked air/fuel ratio of 4 to 5% CO that gradually decreased until the choke was completely open at ∿120 seconds. The actual settings can be found on the respective CVS data sheets in the Appendices.

The results of these tests are shown in TABLE III-6. During the course of the tests, the Early Fuel Evaporation (EFE) valve was disconnected to allow exhaust gas flow to the passenger side catalyst during the critical warm-up time. It is during this time that the oxygen getter and NOx catalyst are subjected to conditions that promote oxidation of exhaust gas constituents. This oxidation releases heat which decreases the time the catalysts require to reach operating temperature. Intuitively, blocking gas flow to one side of the engine would result in longer heat-up rates. Although no changes in conversion efficiencies were experienced when the EFE was disabled, it was decided that the expected effect had been masked by the relatively new condition of the NOx catalysts or the extra mass of the large five inch catalysts.

For comparison testing, a four inch catalyst system, consisting of two four inch oxygen getters, two four inch diameter GEM 68 reduction catalysts, and the two PTX II-C oxidation catalysts, was installed on the vehicle. Minor carburetion changes were made to accommodate for the change in exhaust system backpressure and CVS tests were begun. The test results are shown in TABLE III-8.

First, in comparing the four inch catalysts warm-up rates to those of the five inch system with the same nominal inlet gas concentration, FIGURE III-12 illustrates the additional time required to reach light off temperature for the five inch system. The result of this extra mass of the larger oxygen getter can be seen in the temperature measurements taken at the reduction catalyst inlet. The time required to reach 700° F is lengthened from ∿27 seconds to 51 seconds. The effect of the larger NOx catalyst with its 70% extra mass is even more significant in FIGURE III-13. The measurements taken at the exit of the NOx catalyst show that the time for a five inch catalyst to reach 1,000° F increases from 75 seconds for a four inch system to 168 seconds for a five inch system. This time could be shortened; however, most conventional methods would result in increased fuel consumption. Data analysis shows that the majority of increased fuel consumption over baseline occurs during the cold start due, to a large degree, to the rich choke and resultant richer air/fuel ratio. It is doubtful that equivalent heat-up rates could be reached even neglecting fuel consumption considerations. Therefore, it was felt that the four inch system had greater potential for best performance and was designated as the prime system for further optimization. This decision was further substantiated by the fact that neither system demonstrated superior NOx performance with respect to each other.

High Volume Air Pump

During the course of testing the five inch system, comparison tests were performed using the 22 CID air pump. These data are summarized in TABLE III-7. Reviewing the data show that the air pump (see FIGURE III-11) had little effect on emissions, but appeared to have an adverse effect on fuel consumption.

Disregarding the cold transient bag (BAG 1) due to its sensitivity to other factors, the weighted fuel consumption during portions of a CVS test show a 3 to 6% increase in fuel consumption. Although the large pump requires more noresepower than a standard air pump, it was felt that this factor alone could not be responsible for all of the increase. Subsequent conversations with the manufacturer's engineers revealed that due to the inherent sensitivity of the backpressure EGR valve, its operation was affected by the output of the pump. Thus, in the interests of stability, coupled with the fact that the larger pump did not lower tailpipe emissions and did raise fuel consumption, the large air pump was removed in favor of the smaller standard version.

Effect of Sulfur on System Performance

Further data analysis of the optimization tests showed a marked tendency of increasing fuel consumption with time. FIGURE III-14 indicates the trend for all hot transient (BAG 3) and 1976 FTP tests. As seen in the illustration, third bag characterization tests before installation of the catalysts show fluctuating fuel consumption dependent on system/components calibration. However, after catalyst installation, fuel consumption is seen increasing with time. Major changes made to the vehicle during the test sequence are indicated. As seen, the trend appears to be independent of system changes. Third bag tests labelled A and A^1 represent nominally identical configurations; that is, same recycle rate, initial timing and spark advance curves. By comparison, it is apparent that fuel consumption has increased by 20%. In addition, FIGURE III-15 shows a gradual tendency of increasing hydrocarbon emissions accompanied by slightly decreasing NOx emission rates.

To define the component/components responsible, a test series was initiated which consisted of returning the vehicle to original condition in stages. The results of these tests are shown in TABLE III-9. The data indicate that as this system was returned to the original OEM configurations, fuel consumption was reduced to the point where further tests were considered unnecessary. From these data, it is apparent that the vehicle itself was not responsible for the deteriorating fuel consumption, but rather the system calibration or components themselves were. A table comparing the original and new baseline tests is provided in TABLE III-10 and shows that fuel consumption was near equal.

Additional tests performed on the vehicle showed that the backpressure EGR valve was experiencing higher exhaust system backpressure with time. These measurements were made near the base of the EGR valve by adding a pressure tap to the EGR spacer block. The data shown in TABLE III-11 show as high as an 18% gain in backpressure for these catalysts versus a fresh set of catalysts. Since the catalysts originally in the vehicle were at relatively low mileage, it was felt that the change in backpressure would continue to increase resulting in even higher EGR recycle rates with time. These data suggested that if adequate desensitization of the valves could not be accomplished their use would have to be precluded on the vehicle.

The actual method by which the catalyst backpressure increases has been under investigation (refer to "History of Contract"). Some increase is expected due to active surface generation, however, accelerated rates of generation have been recently seen in other in-house vehicle tests on GEM 68 with fuel sulfur levels at 0.03 wt %.

Attempts to desensitize the EGR valve consisted of smaller orifices (lower recycle rate) and stronger outer control springs. The static open point is preset and cannot be changed. Essentially, the desensitization consisted of lower cycle rates which ultimately resulted in NOx emissions of

0.5 g/km. The test results are shown in TABLE III-12. This emission rate was far above the target level to meet 0.25 g/km for 50,000 miles. Additionally, it was felt that the valve would still be sensitive to backpressure changes as the initial set point was unadjustable. Furthermore, it was largely unknown to what degree sulfur exposure would effect the NOx reduction catalysts. Therefore, in the interests of stability, testing began with California type dual-diaphragm EGR valves.

Dual-Diaphragm EGR Valves

This valve is similar to the port vacuum operated valve found on most vehicles except that a second vacuum chamber, connected to intake manifold vacuum, is located beneath the diaphragm. A cross section of this valve is provided in FIGURE III-16. At a certain ported vacuum signal, the construction of the valve allows relatively greater valve openings at low manifold vacuum than at high manifold vacuum levels. The result is greater recycle rates on accelerations when compared to a standard ported vacuum EGR valve. Additionally, the lower vacuum chamber assures good idle quality by forcing the valve closed.

Initial tests utilizing this valve were performed on vehicle 24. TABLE III-12 lists these tests along with a description of the system settings. Hydrocarbon emission rates were ∿0.25 g/km with NOx emission rates about 0.32 g/km. Calibration tests were concluded and three zero mile emissions and fuel consumption tests were performed on the vehicles. These results are listed in TABLE III-13 and the specifications are shown in TABLE III-1.

While final calibration tests were being conducted on vehicle 24, calibration of the second vehicle, ETV 25, was initiated and both the backpressure and dual-diaphragm valves were tested. Based on the data generated with the first vehicle, optimization was centered on the use of the dual-diaphragm valves. The calibration tests are listed in TABLE III-14 and reflect minor adjustments to the choke and carburetor along with the addition of a retard override mechanism.

The addition of a cold start retard override was considered beneficial in that it will help prevent stalling during cold starts. The system, which senses manifold vacuum, allows vacuum to the advance mechanism of the disbributor in the event that manifold vacuum falls to 9" to 10" Hg.

The use of the 45 second cold start retard (in this case, a lack of manifold vacuum to the advance mechanism) is justified by the understanding that not only does it raise the exhaust gas temperature during the most critical portion of the test, but also lowers the feedgas hydrocarbon and NOx emission rates. Additionally, the retard shortens the length of time required for the engine to reach operating temperature, which in turn benefits carburetor control in that the air/fuel ratio is more stable and repeatable.

Confirmation Testing

During the course of this testing, vehicle 24 was taken to the Ann Arbor Laboratory for confirmatory testing of the system as calibrated with the backpressure valve. The purpose of these tests was not only to establish the integrity of the Gould emission measurements, but to allow a direct data comparison to the second vehicle with its different system calibration. The data obtained from the EPA on the first vehicle is included as TABLE III-15 along with original baseline and "zero mile" tests performed in Gould's laboratory. Sulfate test results are shown in TABLE III-16.

The data indicate reasonable correlation with the EPA's Motor Vehicle Laboratory with hydrocarbon emissions less than those measured at the Gould test facility. After sulfate testing, this vehicle was trailered back to Gould's facility for further testing and system updating. Initial work started with the preferred dual-diaphragm EGR valve. In addition, a retard override system and an electric choke were evaluated during a series of tests, the results of which are compared in TABLE III-17. Replacement of the bimetallic choke spring with the electric choke was intended to provide for more stable and reproducible operation during the course of the 50,000 mile durability test. Some initial benefit in terms of reproducibility was expected due to the nature of the mechanism.

The second vehicle, ETV 25, was taken to the EPA testing facility for zero mile confirmation tests. The vehicle was equipped as described in FIGURE III-17 along with the dual-diaphragm EGR valve. Results of the tests performed at Ann Arbor are compared to in-house measurements shown in TABLE III-18. Sulfate tests results for this vehicle are also shown in TABLE III-16. Again, the measurements indicated reasonable correlation with the Gould data with hydrocarbon emissions less than those measured at Gould.

Although earlier tests on the backpressure EGR valve indicated a slight advantage (∿2%) in fuel consumption over the ported type, this advantage was not evidenced in the tests performed on ETV 24 and 25. The raised backpressure of the catalysts and inherent vehicle variances that exist may have been enough to offset the anticipated results. As the catalyst tests were being completed on both vehicles, calibration of the third vehicle was started. The system was optimized essentially the same as those on the two previous vehicles. Choke optimization tests, similar to the other vehicles, were performed and the tests results generated during the test series set-up are listed in TABLE III-19. The actual choke settings can be found on the respective CVS data sheets in the Appendices.

Catalyst System Efficiency

In determining catalyst efficiency, a system simulating the backpressure of all the catalysts was installed on each vehicle. Normal 1975 FTP emission tests were then performed to determine output emission rate from the engine. Calculation of catalyst efficiencies during the FTP are shown in TABLE III-20, 21, and 22 along with the actual emission measurements. NOx catalyst efficiencies could be expected to improve with mileage accumulation as the catalyst surface reaches a stable surface morphology. However, it is doubtful that catalyst efficiency would increase to the point where the target 0.19 to 0.22 g/km NOx emission could be reached (equivalent to 60 to 70% efficiency) while holding fuel consumption losses at the same level. Targeting the system for a less stringent standard, however, would allow certain calibration changes enabling some fuel consumption decreases.

After meetings with the Project Officer and thoroughly discussing the fuel sulfur levels found in recent pool gasoline, the decision was made to delay the start of mileage accumulation until a more sulfur resistant catalyst could be developed by Gould and proven by in-house durability tests.

Heat Conservation Techniques

In the interim, it was decided to evaluate various means of heat conservation techniques consisting principally of exhaust port liners and insulated exhaust manifolds. It had been intended to evaluate exhaust manifolds with low thermal inertia characteristics, however, the availability and cost of casting cores and patterns was such as to make this impractical for this contractual effort.

The objectives of these tests were to determine the exhaust gas temperature increase realized by these techniques and establish the effect on catalyst activity during emission tests. Although the catalysts used during this test sequence were of an alloy shown to be more sulfur tolerant than GEM 68, they were not capable of performing at the required level of activity and extended durability necessary to comply with the "scope of work", Appendix 5.

The various techniques were applied to ETV 24 in stages to characterize the effect of each. The insulation used on the manifolds was 12.7 MM (0.5 inch) thick fiberglass mat covered with heavy gauge aluminum foil. The port liners were made of stainless steel with an air spacing between them and the cast iron exhaust ports. The complete head assemblies were provided by the EPA.

In the interests of time, the tests were started while the engine was warm. The cold transient (BAG 1) phase of the test was not used in the characterization analysis but was considered to be an adequate prep for the cold stabilized phase (BAG 2).

TABLE III-23 is a summary of the average termperatures of the exhaust gas as measured with chromel-alumel thermocouples near the inlet of the oxygen getter catalyst. The cold stabilized (BAG 2) temperatures represent an average of the last 300 seconds of the phase, while the hot transient (BAG 3) temperatures are an average of 300 seconds starting with the idle period before the 55 mile per hour acceleration. Delays were experienced in generating test data as one of the intake valve guides was oversize which allowed excessive oil leakage into the combustion chamber. This necessitated removal of the head for corrective machining.

In reviewing the data, it can be seen that the insulated manifolds, when used in conjunction with the port lined heads, provided for the highest average temperature increase. In the tests without EGR, second and third bag temperatures were increased by 60° and 44° C, while the tests with EGR showed increases of only 32° and 27° C, respectively. It can be seen by reviewing the NOx emission data in TABLE III-24 that the EGR rate is lower with the port liners. This reduced EGR rate was found to be caused by an unusually small opening at the port liner leading to the EGR passage. It is felt that with equal recycle rates, the temperature increases obtained with the port lined heads would be equal to those obtained with the port lined heads in tests without EGR. Therefore, it must be kept in mind that the temperatures at equal recycle rates would be even higher than indicated.

Further analysis of the data shows that the insulated manifolds effected a larger temperature increase than port liners used by themselves. In some instances, the tests were rerun to establish the integrity of the data.

By measuring tailpipe emission rates and then determining feedgas levels in the same system configuration, data were gathered to compare the effect of the increased temperature on catalyst efficiency. Summarized in TABLE III-24, the data indicate that generally, as the inlet temperature was raised, NOx efficiency improved. Furthermore, the conversion efficiency of the NOx catalysts does appear to be somewhat sensitive to inlet NOx levels as anticipated based on the laboratory graphs of FIGURE III-18. By virtue of the dependence of conversion efficiency on inlet NOx levels, it appears that the NOx level at which a drop in conversion efficiency could be expected for these temperatures is near the levels tested.

Steady-state conversion efficiencies were also measured at two different vehicle speeds while the vehicle was in each configuration. The resultant data agreed with that shown in FIGURE III-18 which exhibits the expected decreasing efficiency with decreasing temperature and/or inlet NOx level. The changes in linear and space velocities (caused by different engine speeds) are not reflected in the FIGURE.

Some cold start 1975 FTP emission tests were performed to determine the effect of the port liners and insulated manifolds on gas temperature heat-up rate. A list of calibration tests is shown in TABLE III-25. Catalyst bed temperature measurements were not taken as the flow disruption caused by the presence of the thermocouple can be detrimental to catalyst performance.

A comparison of the heat-up rates is shown in FIGURE III-19. The shaded area indicates the temperature limits over three tests. The data show that the port lined heads and insulated manifolds provide for a 65^{o} to 95^{o} C higher temperature over the conventional heads except during the 20 second idle prior to the 55 mile per hour acceleration. From a cold start, the ability of the port liners to reduce the heat loss to the head is evident within 15 seconds of engine start. No further optimization of the cold start system was attempted, however, it is felt that the fuel consumption loss encountered in the cold transient bag (BAG 1) could be reduced by utilization of this technology.

Undoubtedly, further application of these principles through better interior exhaust manifold coatings, superior exterior insulation, and lightweight (low thermal mass) metallic alloys could further decrease the heat loss through the manifolds. The increase in temperature would not only provide for faster times to operating temperatures and better NOx efficiency, but would most likely allow the removal of the retard and might allow for somewhat leaner choke settings.

Examination of the gaseous emission data in TABLE III-26 shows that 1975 FTP NOx conversion efficiency was improved by 30%. A significant portion of the increase occurred in the hot transient bag (BAG 3) with less of an improvement in the cold stabilized bag (BAG 2). The cold transient bag (BAG 1) efficiency remained nearly the same and may reflect the need for additional cold start system development. It is felt that, in addition to removal of the cold start retard, techniques such as compression and valve timing changes could be applied to decrease fuel consumption until tailpipe NOx emissions equalled those achieved without the port liners and insulated manifolds. This effort is made possible by the NOx catalyst characteristics of increased efficiency with increased temperature due to lower ammonia formation. Thus, it is felt that heat conservation techniques could provide for decreases in fuel consumption for equivalent tailpipe emission rates.

Further analysis of the data in TABLE III-26 show that the hydrocarbon conversion efficiencies for the conventional and high temperature systems are nearly equal (88 versus 84%). This indicates that the port liners and insulated manifolds contribute little towards hydrocarbon oxidation when used with this particular catalyst arrangement and system calibration.

Of concern, though, is the realization that feedgas hydrocarbon emission for the high temperature system increased by 30% over the conventional dual-bed system (1.65 k/gm versus 2.14 g/km).

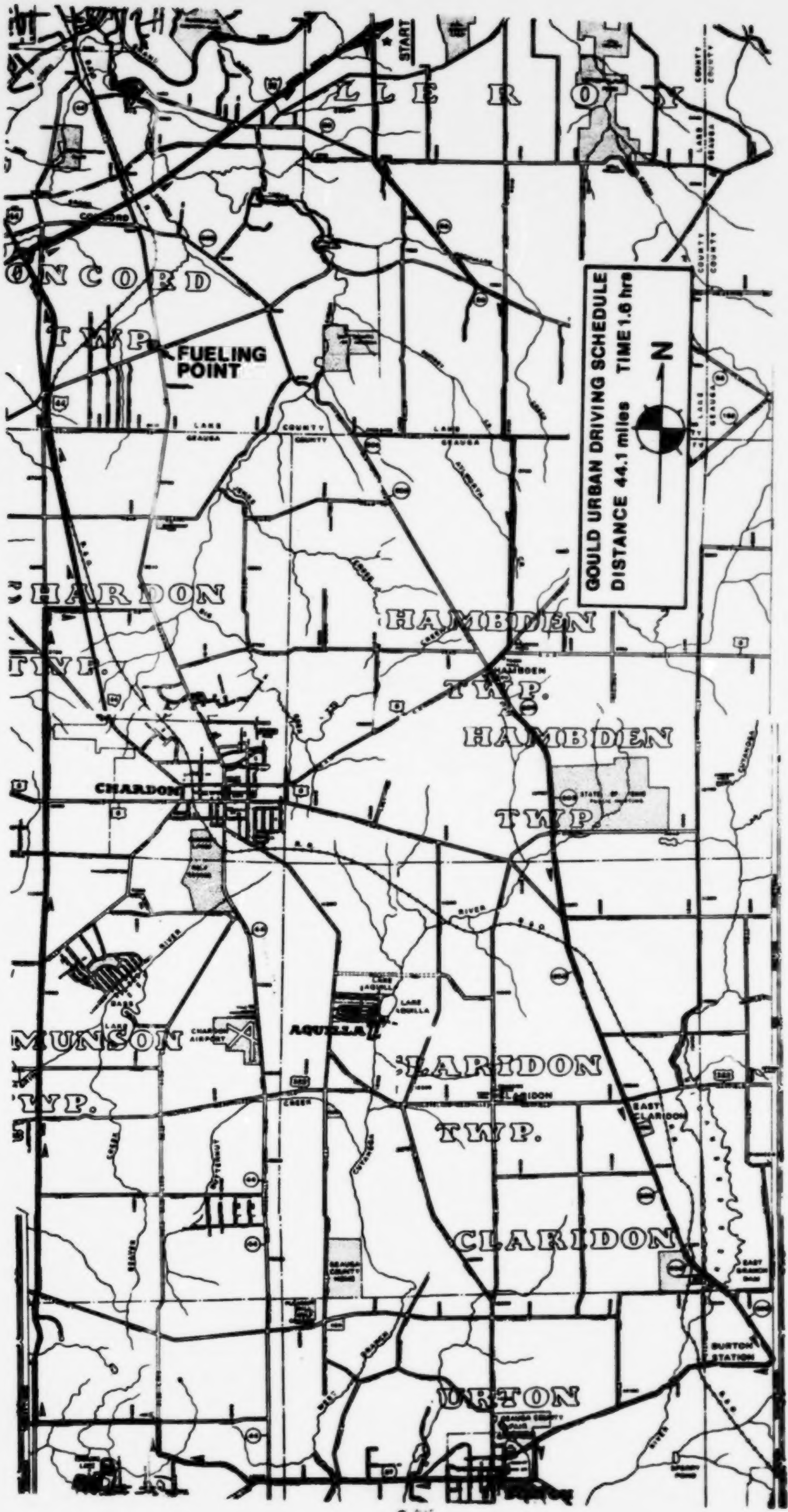
In addition, instability in air/fuel ratio control and gaseous emission rates had become evident. Although some of the variance in emissions shown in TABLE III-26 is due to slight calibration changes of the initial choke opening, engine speed, etc., it is felt that the variance far exceeds the expected as a result of these changes. The causes for these trends has not been identified.

PHASE IV - RECOMMENDATIONS FOR FUTURE EFFORTS

In light of the fact that an alloy sufficiently tolerant to sulfur while maintaining suitable activity to reach a 0.25 g/km NOx emission rate has not been identified, the principal area of effort in future dual catalyst work should be the development of a suitable alloy.

Once such an alloy is identified, further efforts should include examination of improved heat conservation techniques, improved air/fuel metering systems and electronically controlled EGR and spark timing systems to improve the fuel consumption and emissions of vehicles utilizing dual-bed catalyst systems.

FIGURES


START
FUELING POINT
GOULD URBAN DRIVING SCHEDULE
DISTANCE 44.1 miles TIME 1.6 hrs
N
LEROY
CONCORD TWP.
LAKE COUNTY
GEAUGA COUNTY
CHARDON TWP.
HAMBDEN TWP.
HAMBDEN
CHARDON
MUNSON TWP.
CHARDON AIRPORT
AQUILLA
LAKE AQUILLA
CLARIDON TWP.
CLARIDON
EAST CLARIDON
BURTON STATION
BURTON

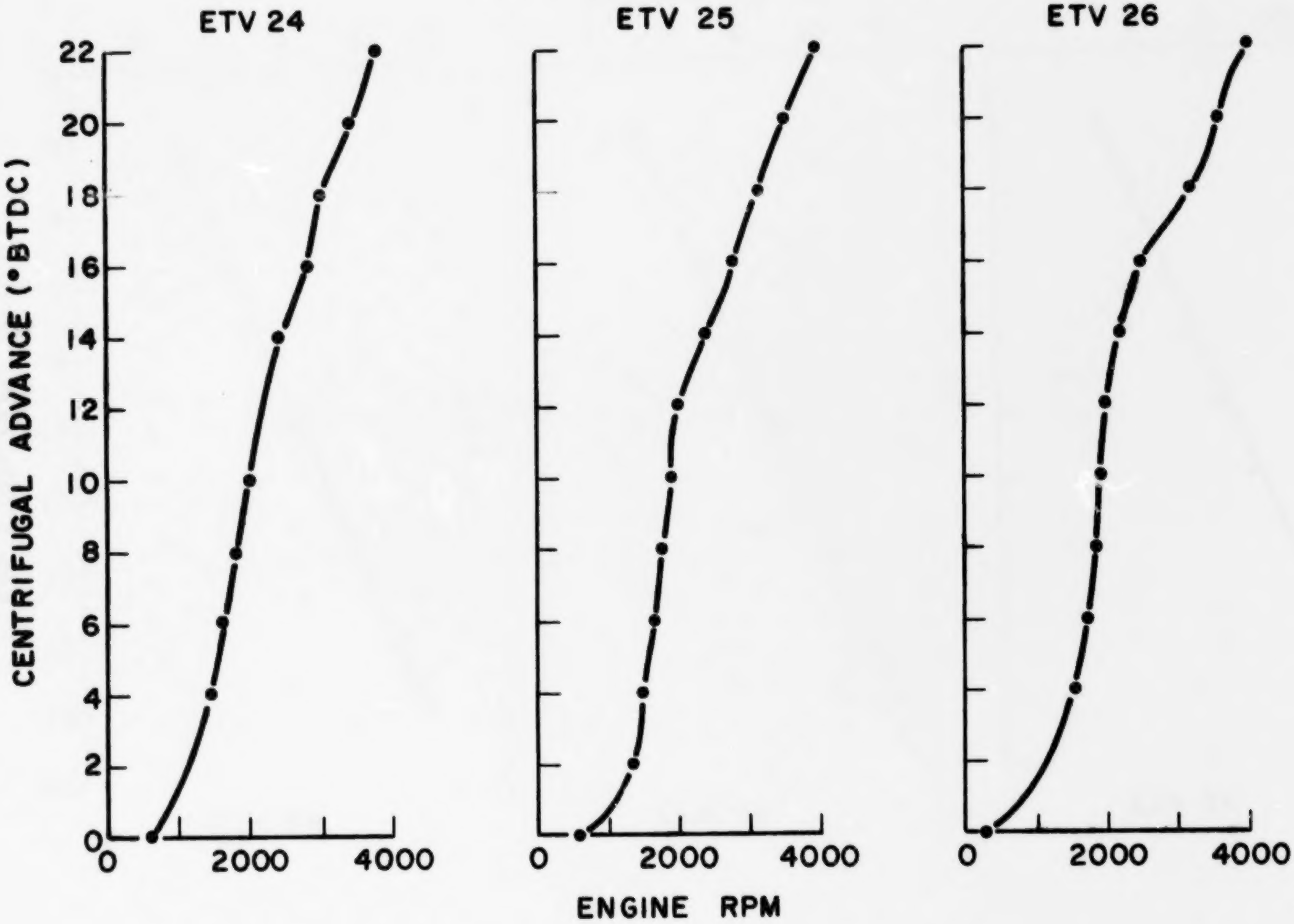


FIGURE I-2: CENTRIFUGAL ADVANCE CURVES

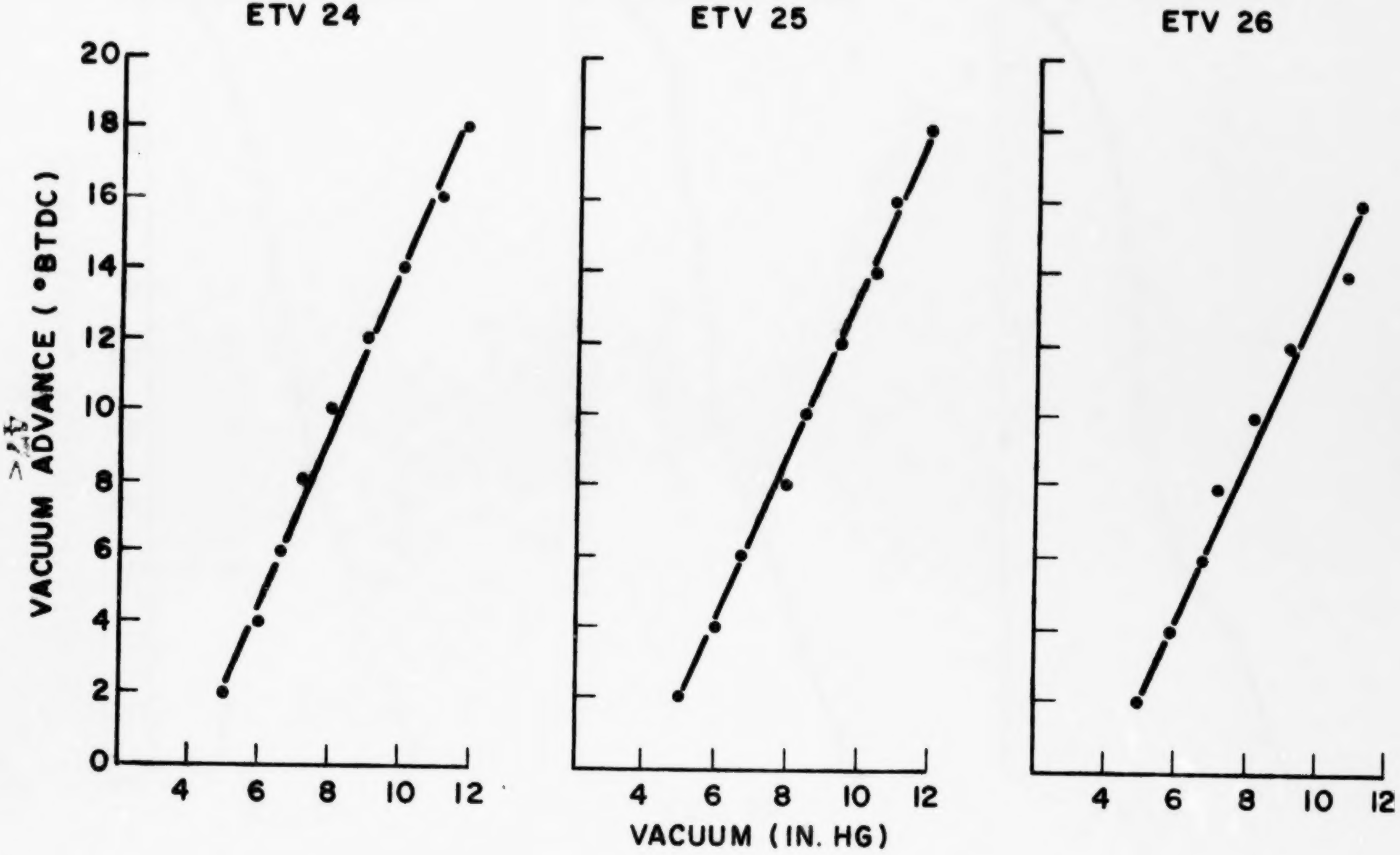
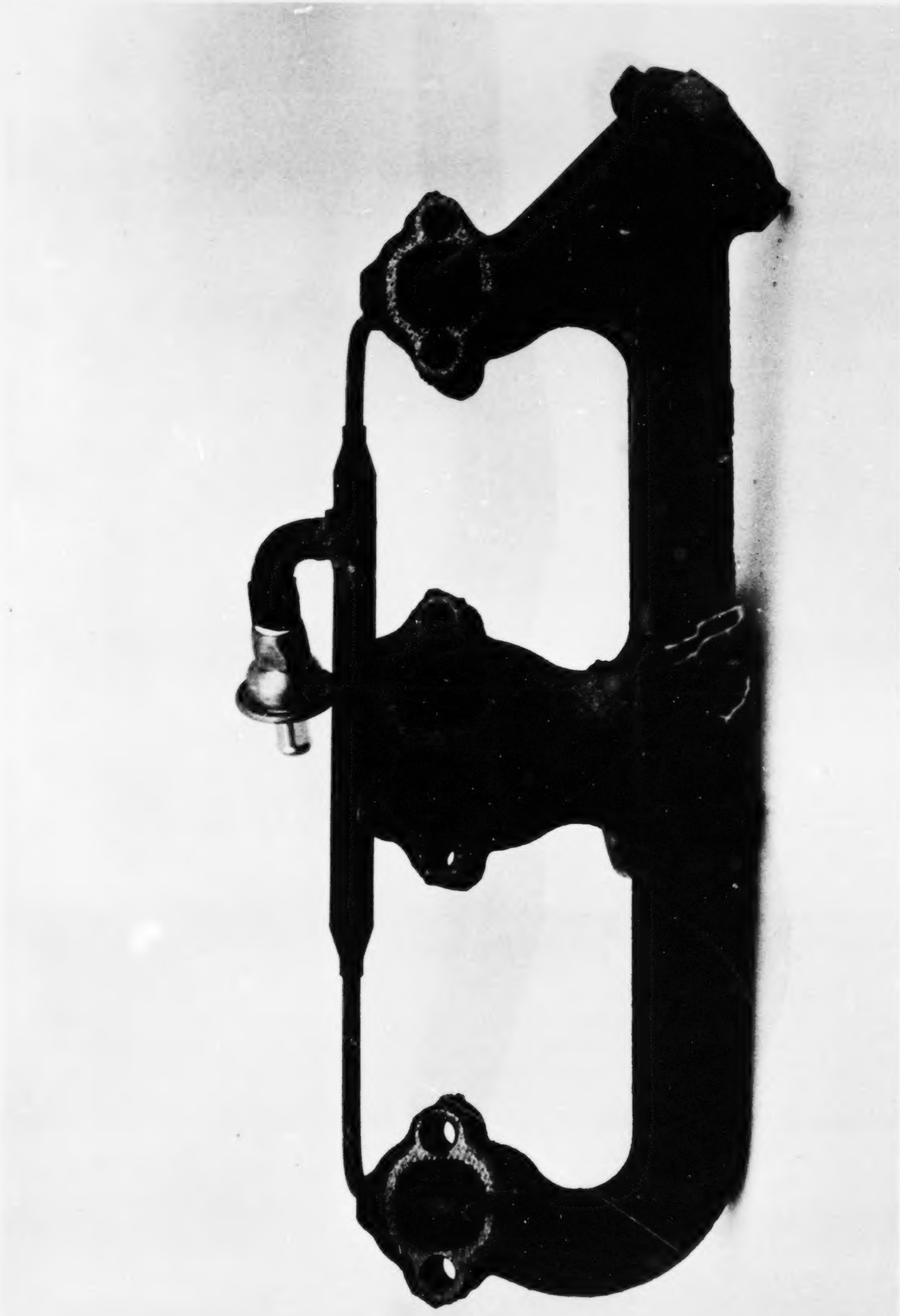
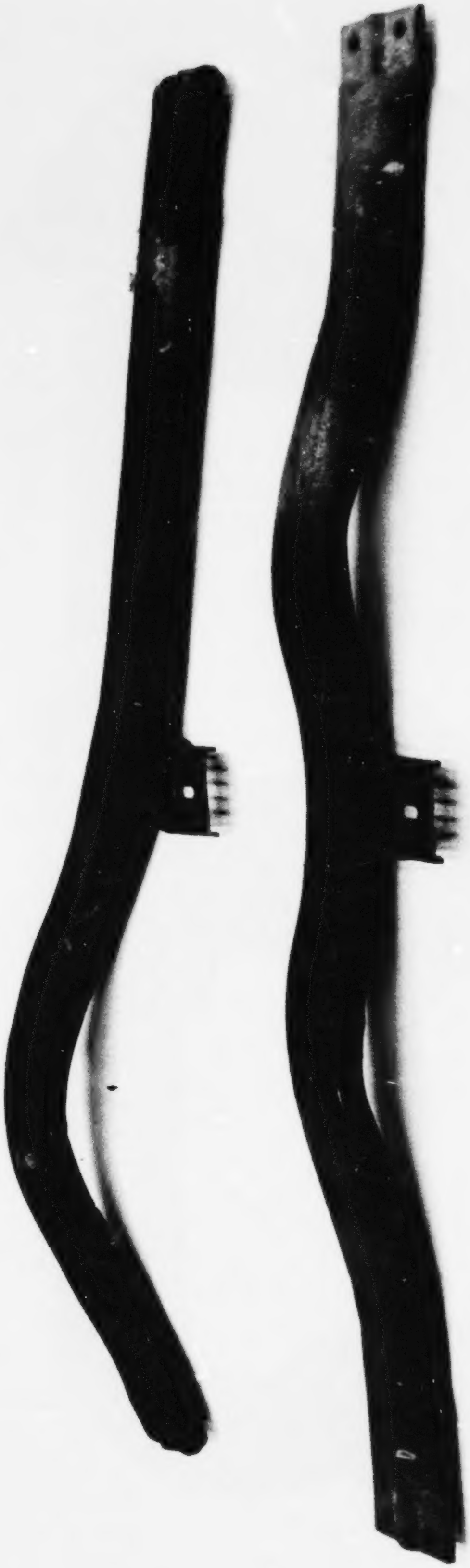


FIGURE I-3: VACUUM ADVANCE CURVES





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REVISIONS			
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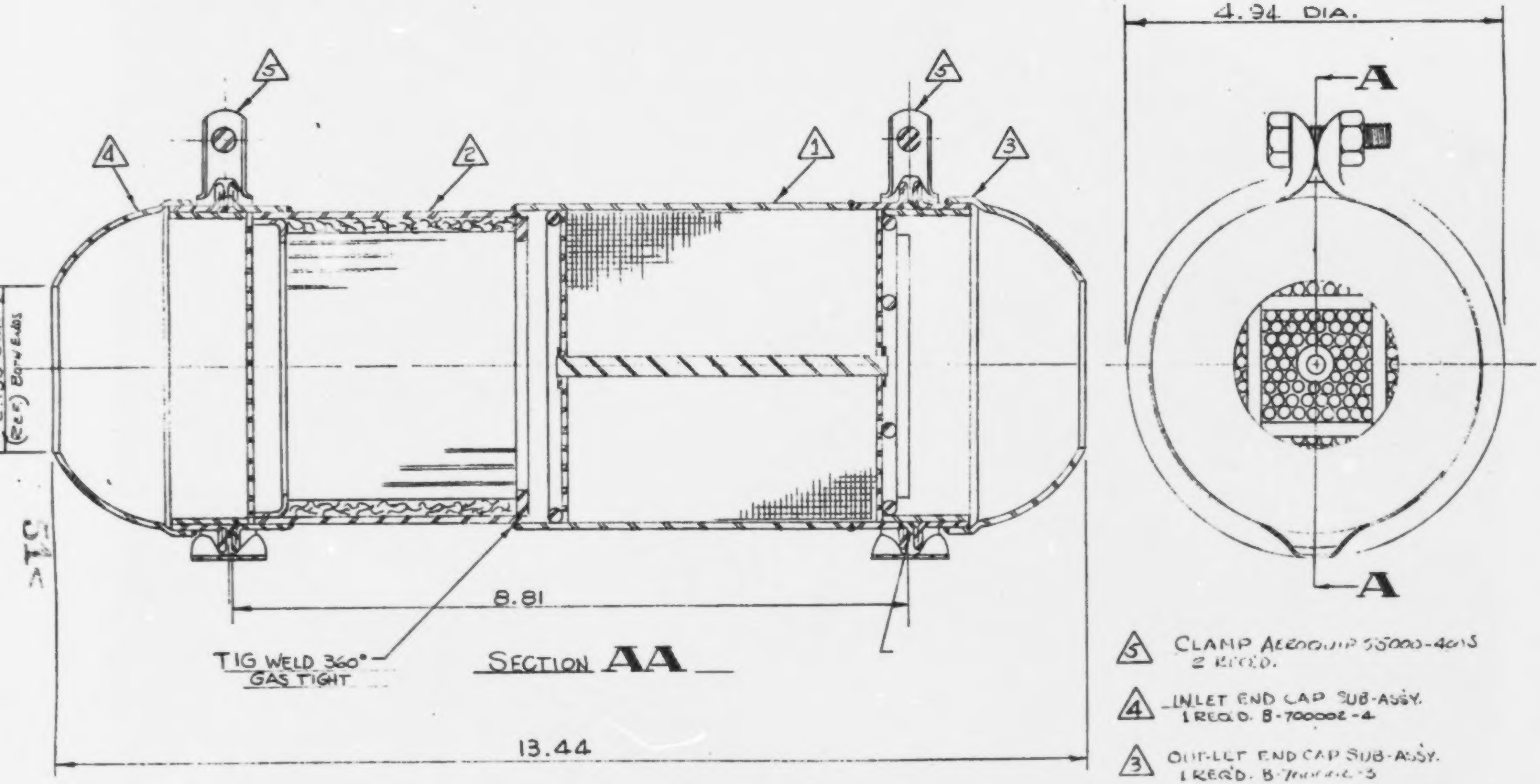
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A
A
5
4
2
1
5
3
(REF) BOTH ENDS
8.81
TIG WELD 360°
GAS TIGHT
SECTION AA
13.44

51<

5 CLAMP AEROQUIP 55000-4015
2 REQ'D.

4 INLET END CAP SUB-ASSY.
1 REQ'D. B-700002-4

3 OUT-LET END CAP SUB-ASSY.
1 REQ'D. B-700002-3

2 OXYGEN-CATALYST SUB-ASSY.
1 REQ'D. B-700001-2

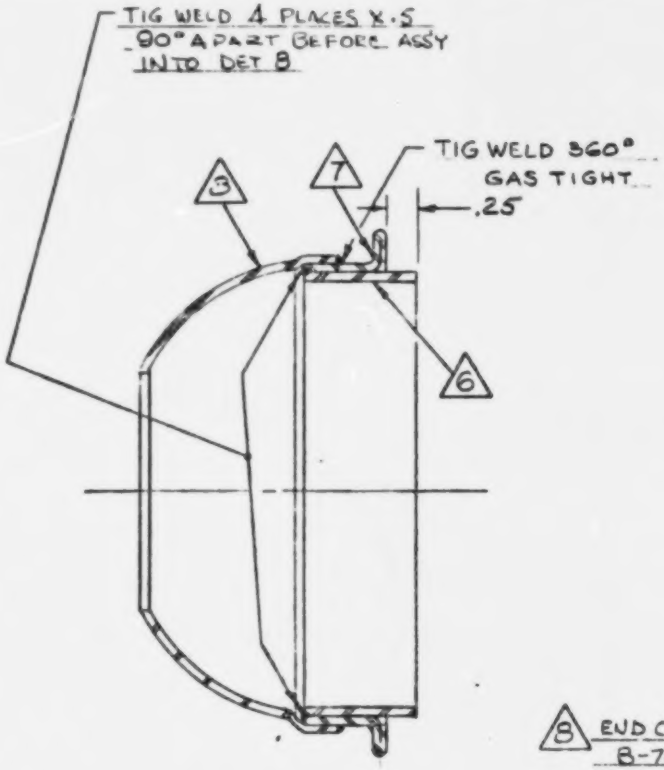
1 NOX-CATALYST SUB-ASSY.
[illegible] B-700001-1
[illegible]

MATERIAL PARTS		DRAWN N. [illegible]	DATE [illegible]	TITLE EXHAUST CATALYST [illegible] ASSEMBLY
HEAT TREAT [illegible]	SCALE F[illegible]	CHECKED [illegible]	DATE [illegible]	
DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL = ± 1/64 ANGLES ± 30' .XX = ± .015 .XXX = ± .005 SURFACE MAX.		DESIGN ENG.	DATE	MADE FOR
		ENG	DATE	SIZE / DRAWING NUMBER / ISSUE
		Q.A.	DATE	

GOULD

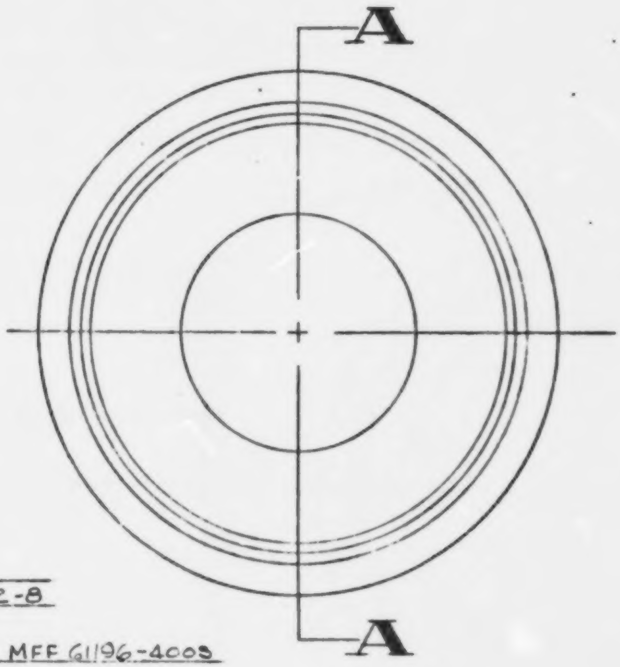
DO NOT SCALE THIS DRAWING

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



TIG WELD 4 PLACES X .5
90° APART BEFORE ASSY
INTO DET 8
TIG WELD 360°
GAS TIGHT
.25
3
7
6

SECTION AA



8 END CAP
B-700002-8

7 AEROQUIP MFF 61196-4005
STAINLESS STEEL FLANGE

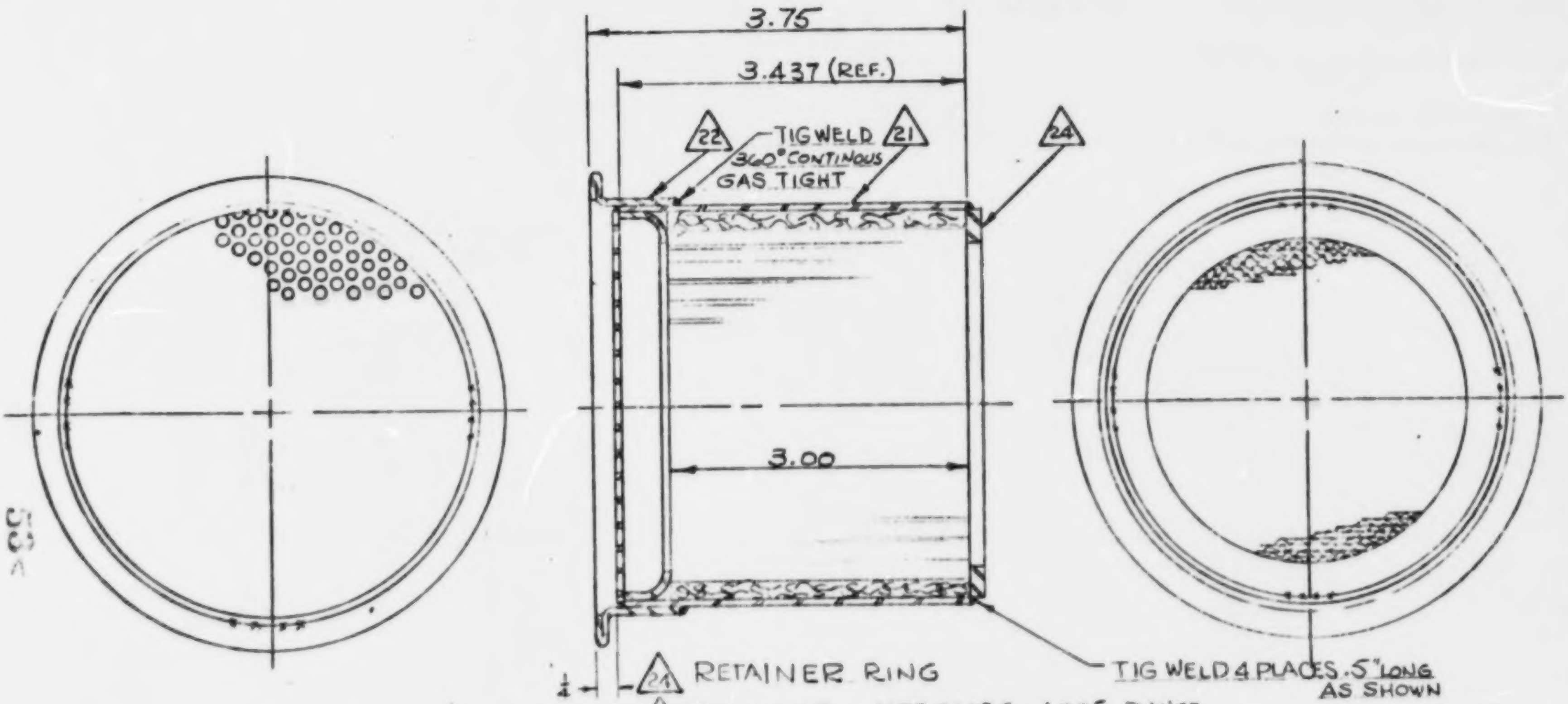
6 PANEL
B 700002-6

MATERIAL [illegible]		DRAWN N. PEFRLI	DATE 12-11-75
HEAT TREAT —	SCALE FULL	CHECKED R. Kinley	DATE 1-16-76
DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL = ± 1/64 ANGLES ± 30' .XX = ± .015 .XXX = ± .005 SURFACE MAX. 63√		DESIGN ENG.	DATE
		ENG.	DATE
		Q.A.	DATE
SQUARENESS & PARALLELISM (FLAT SURFACES)		GOULD	
CONCENTRICITY			

TITLE		
INLET CAP SUB-ASSY. 1 REQ'D.		
MADE FOR		
SIZE	DRAWING NUMBER	ISSUE
B	700002-4	

DO NOT SCALE THIS DRAWING

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL


3.75
3.437 (REF.)
3.00
22
TIGWELD 360° CONTINOUS GAS TIGHT
21
24
TIG WELD 4 PLACES .5" LONG AS SHOWN
1/4

24 RETAINER RING

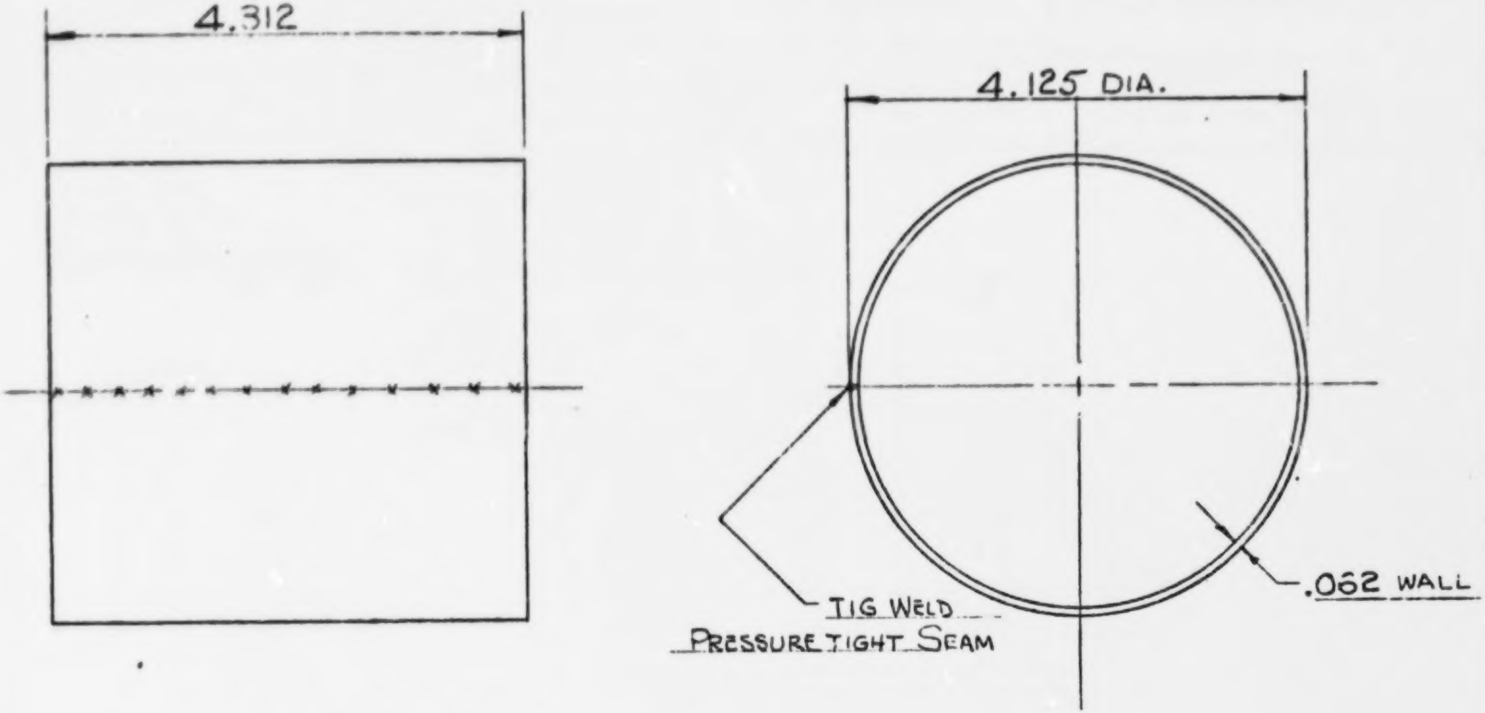
22 B700001-12 B MFF 61196-4005 FLANGE

21 ENGELHARD OXY-GETTER B 700001-21

MATERIAL NOTED		DRAWN N. BEERLI	DATE 11-17-75	TITLE 2 OXYGEN-GETTER SUB-ASSY 1 REQD.
HEAT TREAT —	SCALE FULL	CHECKED [illegible]	DATE 3-16-76	
DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL = ± 1/64 ANGLES ± 30' .XX = ± .015 .XXX = ± .005 SURFACE MAX. 63 √		DESIGN ENG.	DATE	MADE FOR
		ENG.	DATE	
		Q.A.	DATE	
SQUARENESS & PARALLELISM (FLAT SURFACES)		GOULD		SIZE B
CONCENTRICITY				DRAWING NUMBER 700001-2
				ISSUE

DO NOT SCALE THIS DRAWING

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL


4.312
4.125 DIA.
.062 WALL
TIG WELD
PRESSURE TIGHT SEAM

MATERIAL TYPE 304 or 310 SS		DRAWN N. [illegible]	DATE 2-2-76
HEAT TREAT —	SCALE FULL	CHECKED R. [illegible]	DATE 2-16-76
DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL = ± 1/64 ANGLES ± 30' .XX = ± .015 .XXX = ± .005 SURFACE MAX. $^{63}\surd$		DESIGN ENG.	DATE
		ENG.	DATE
		Q.A.	DATE
SQUARENESS & PARALLELISM (FLAT SURFACES)		GOULD	
CONCENTRICITY			

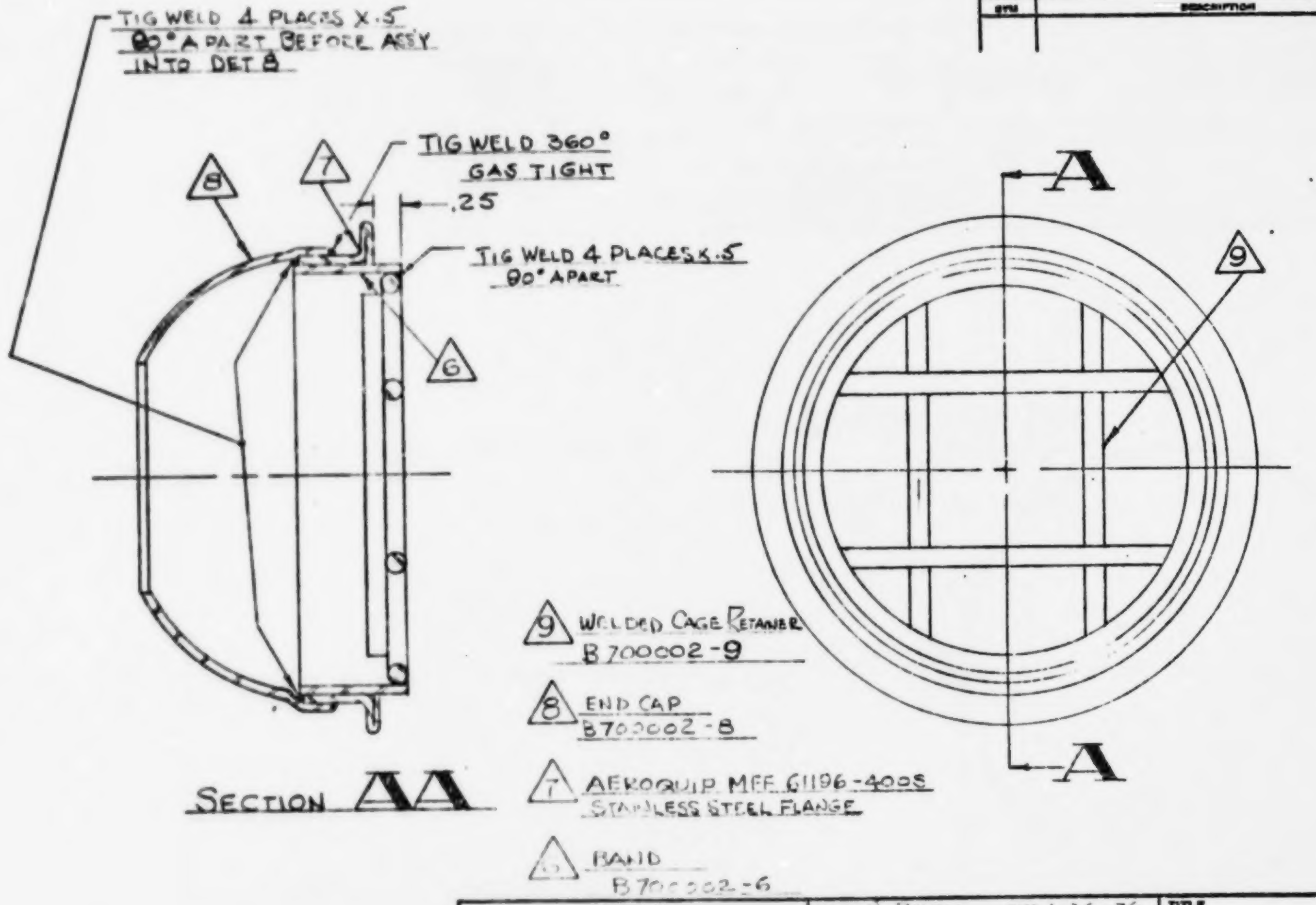
TITLE OUTER SHELL

MADE FOR

SIZE	DRAWING NUMBER	ISSUE
B	700001-12A	

DO NOT SCALE THIS DRAWING

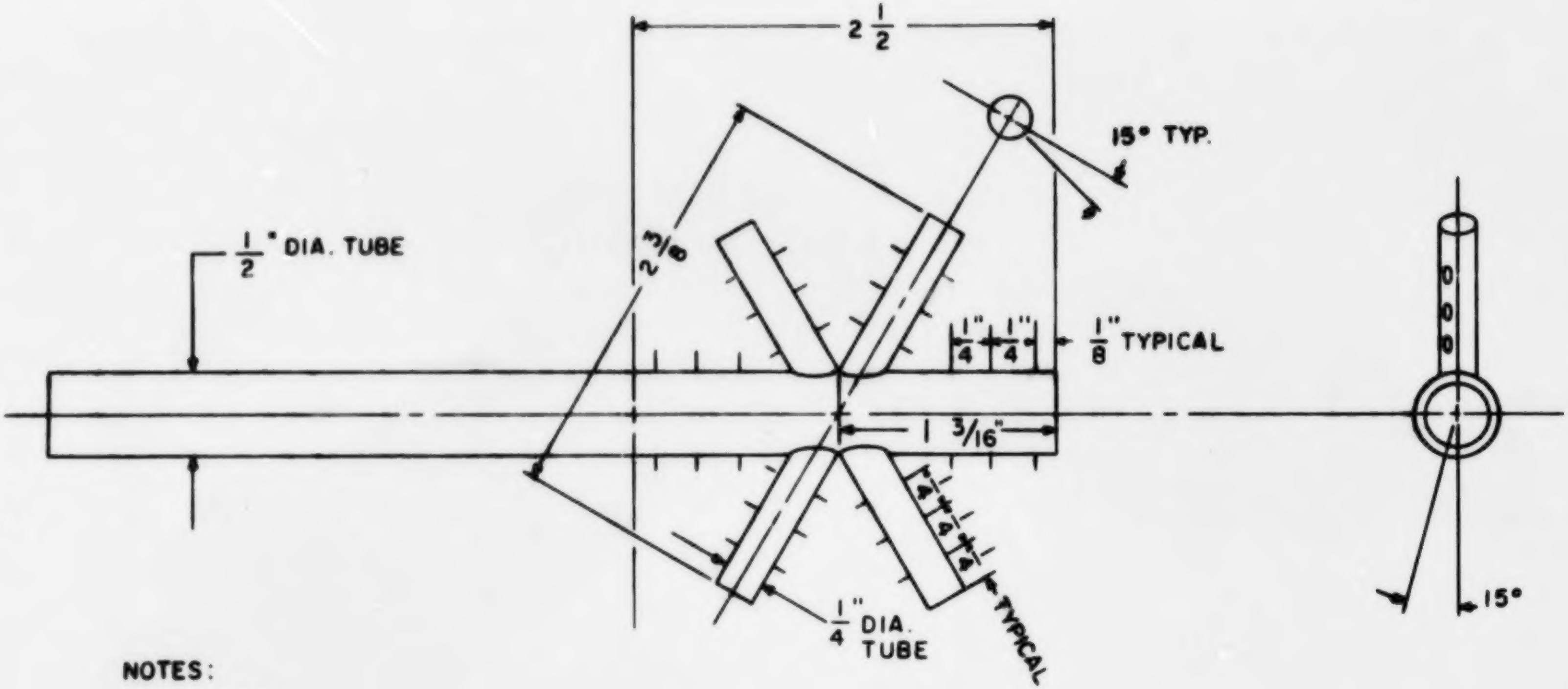
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL


TIG WELD 4 PLACES X .5
90° APART BEFORE ASS'Y
INTO DET 8
TIG WELD 360°
GAS TIGHT
.25
TIG WELD 4 PLACES X .5
90° APART
8
7
6
9
A
A
SECTION AA
9 WELDED CAGE RETAINER
B 700002-9
8 END CAP
B700002-8
7 AEROQUIP MFF 61196-400S
STAINLESS STEEL FLANGE
6 BAND
B700002-6

MATERIAL PARTS		DRAWN N. BIRELI	DATE 1-26-76	TITLE OUTLET CAP SUB-ASS'Y 1 REQ'D.
HEAT TREAT —	SCALE FULL	CHECKED R. Kinney	DATE 2-16-76	
DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL = ± 1/64 ANGLES ± 30' .XX = ± .018 .XXX = ± .005 SURFACE MAX. 63√		DESIGN ENG.	DATE	MADE FOR
SQUARENESS & PARALLELISM (FLAT SURFACES)		ENG.	DATE	
CONCENTRICITY		Q.A.	DATE	

GOULD

SIZE	DRAWING NUMBER	ISSUE
B	700002-3	


2 1/2
15° TYP.
1/2" DIA. TUBE
2 3/8
1/4" 1/4"
1/8" TYPICAL
1 3/16"
1/4 1/4 1/4
TYPICAL
1/4" DIA. TUBE
15°

NOTES:

O.D. 2 1/2"

MAT'L: 304 SS TUBING

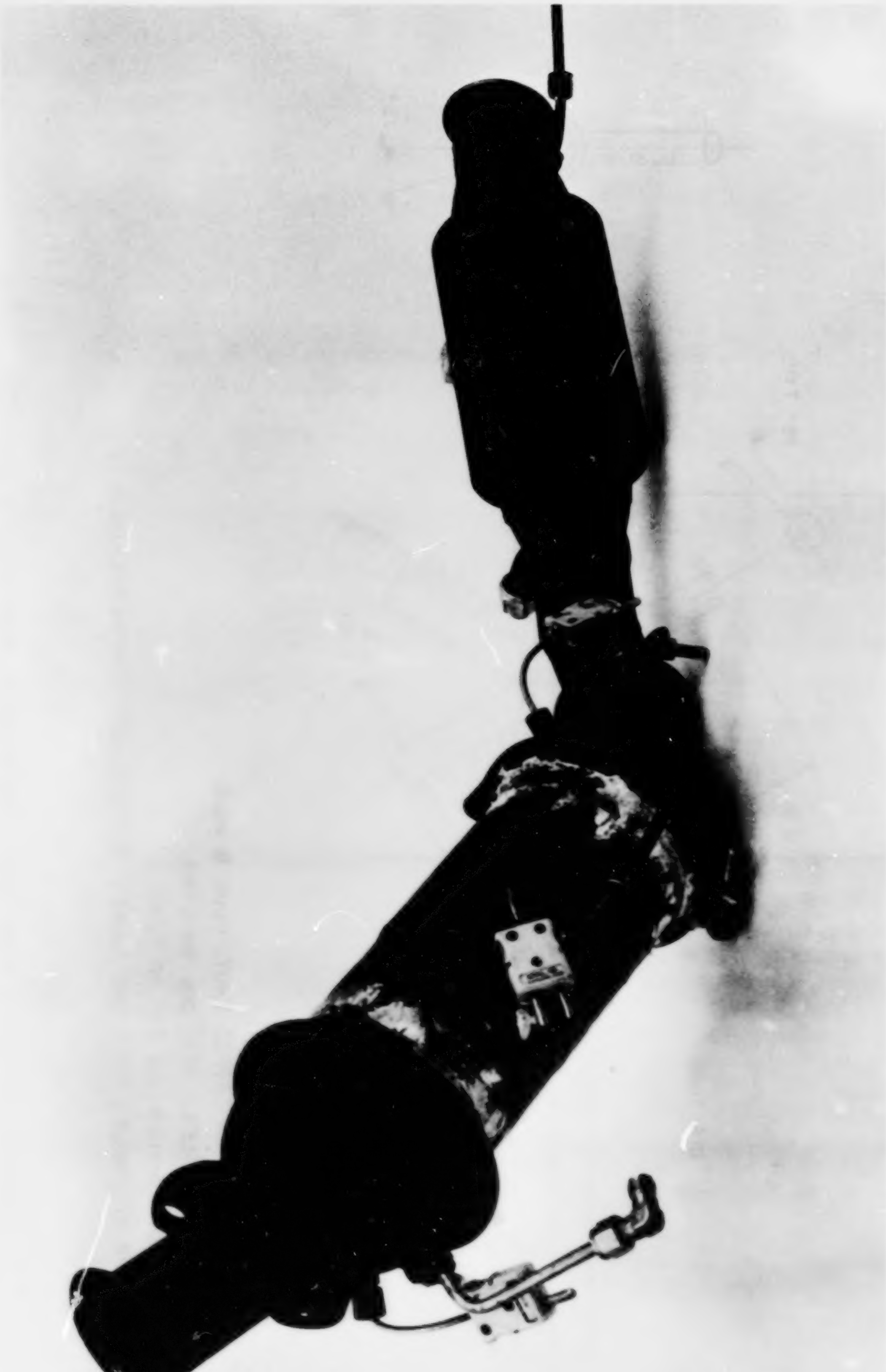
TUBE ENDS ARE CAPPED SHUT; PLUG & WELD

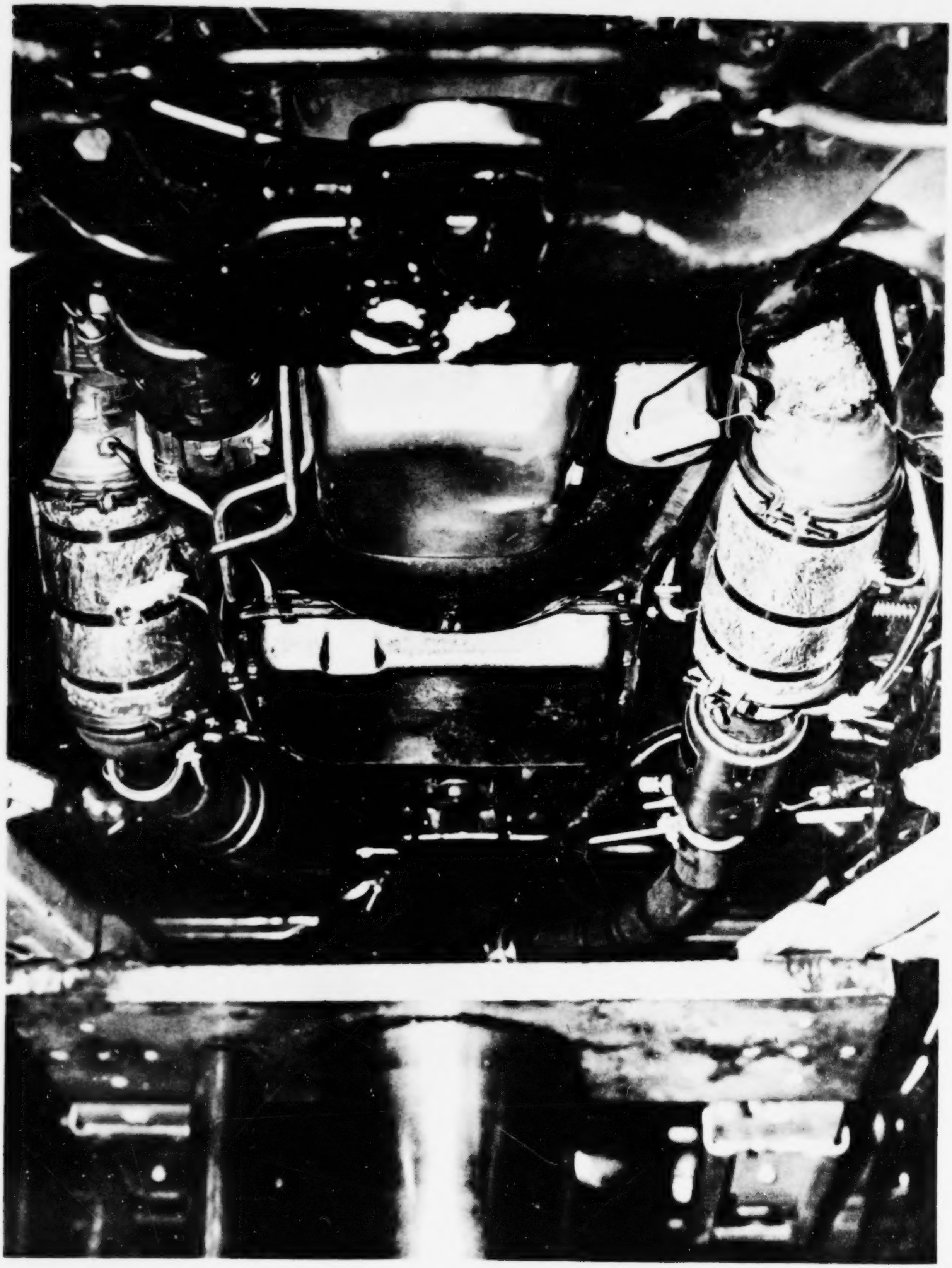
DRILL 36 HOLES, 1/16" DIA. ON CTRS.

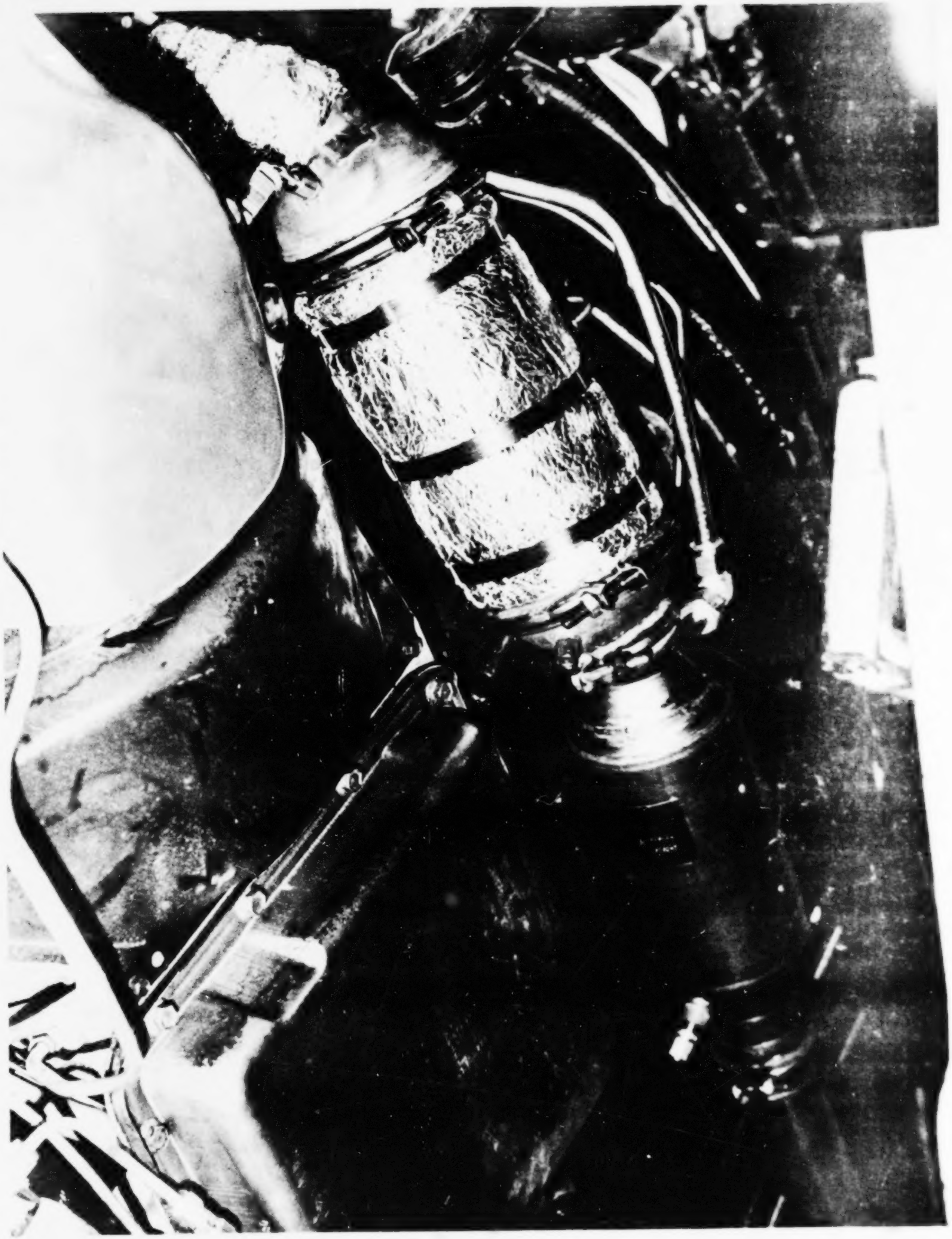
DE-BURR HOLES ON I.D. OF TUBE

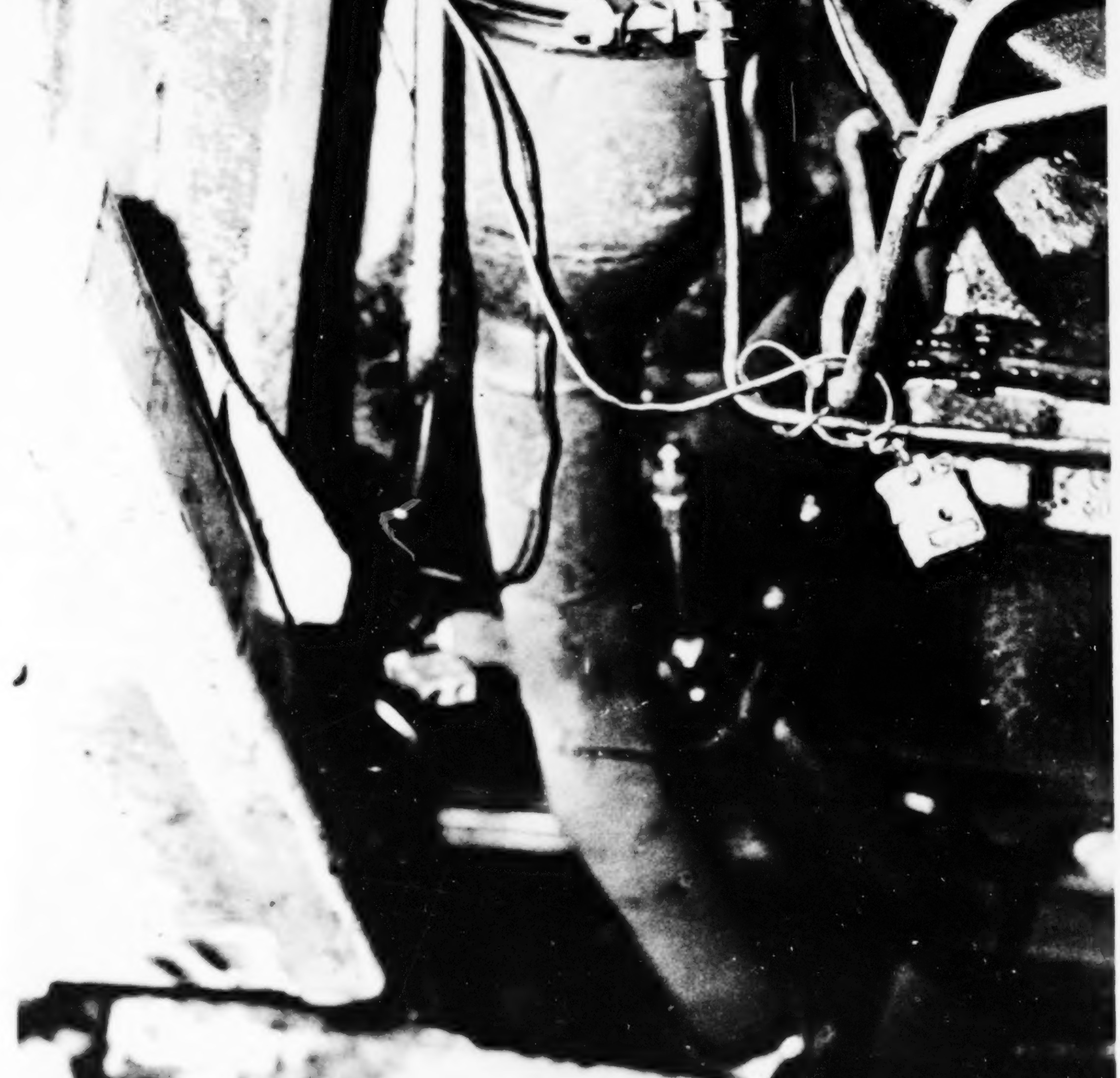
MAKE ALL HOLES FACE THE SAME DIRECTION, 15° FROM PERPENDICULAR

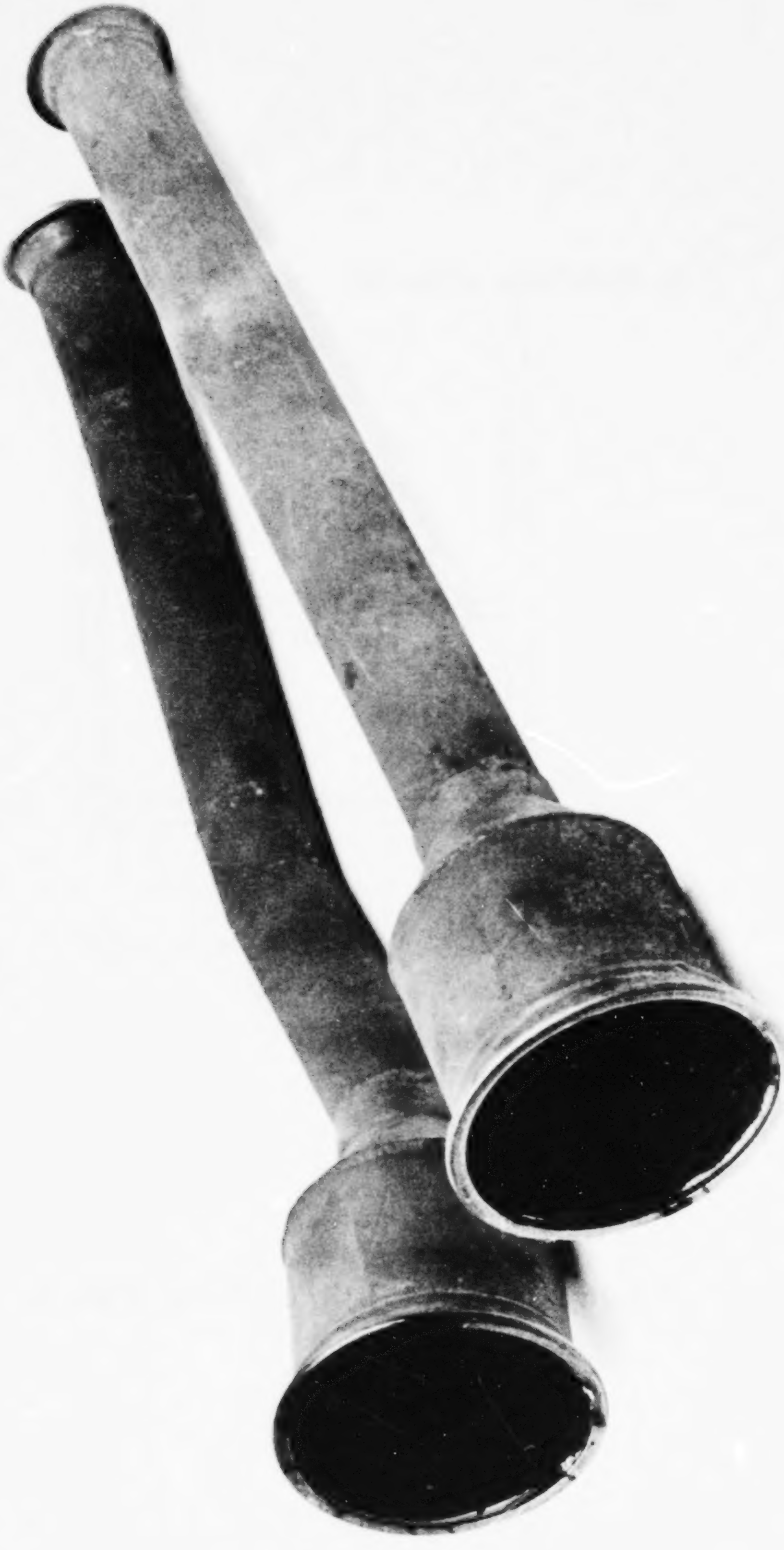
FIGURE II-9: OXIDATION CATALYST AIR DISTRIBUTION TUBE











62<

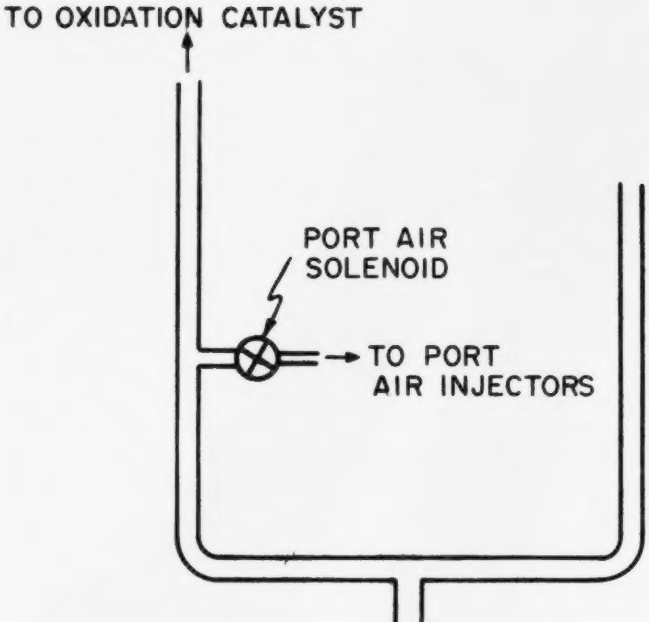
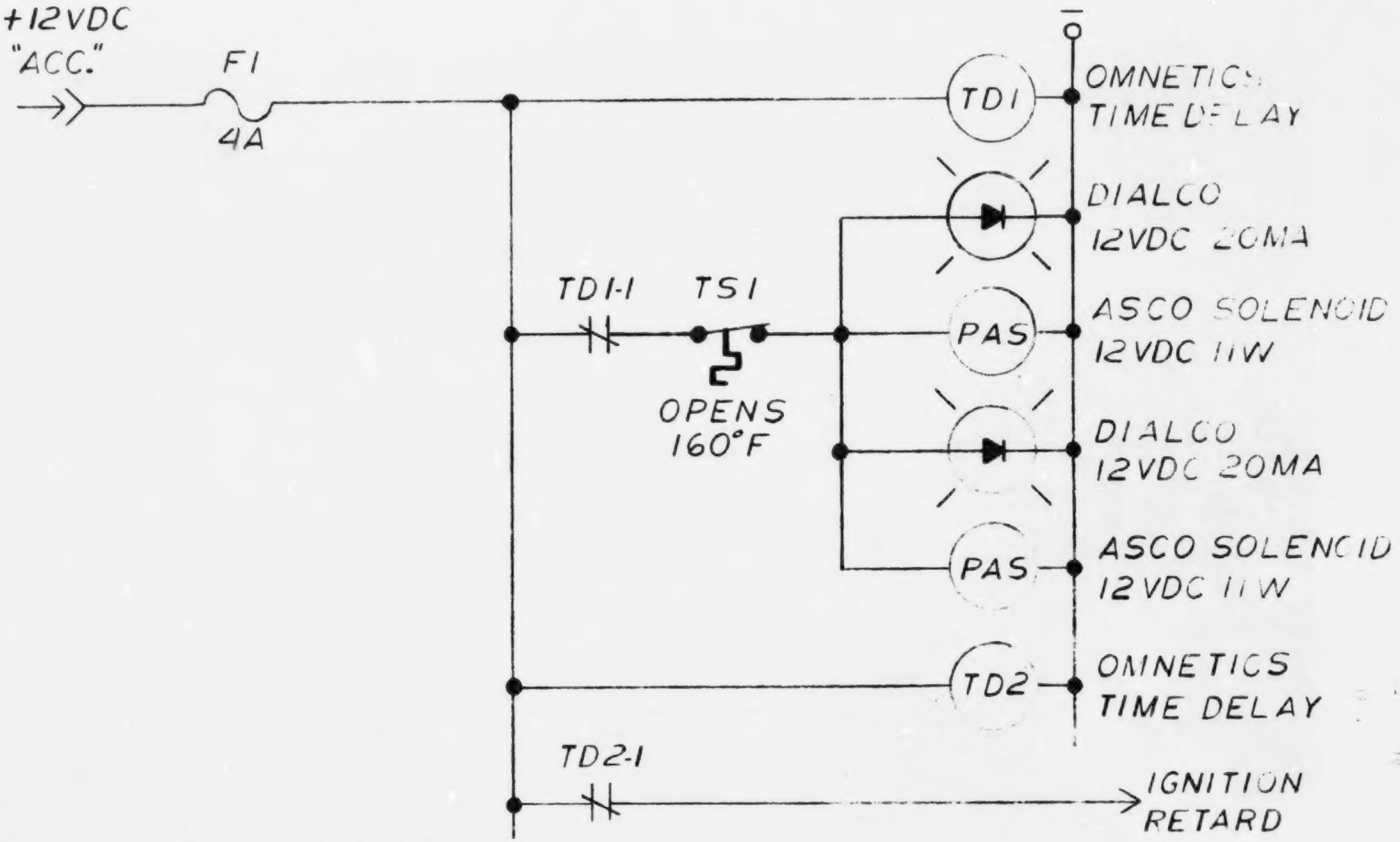

TO OXIDATION CATALYST
PORT AIR SOLENOID
TO PORT AIR INJECTORS
AIR PUMP

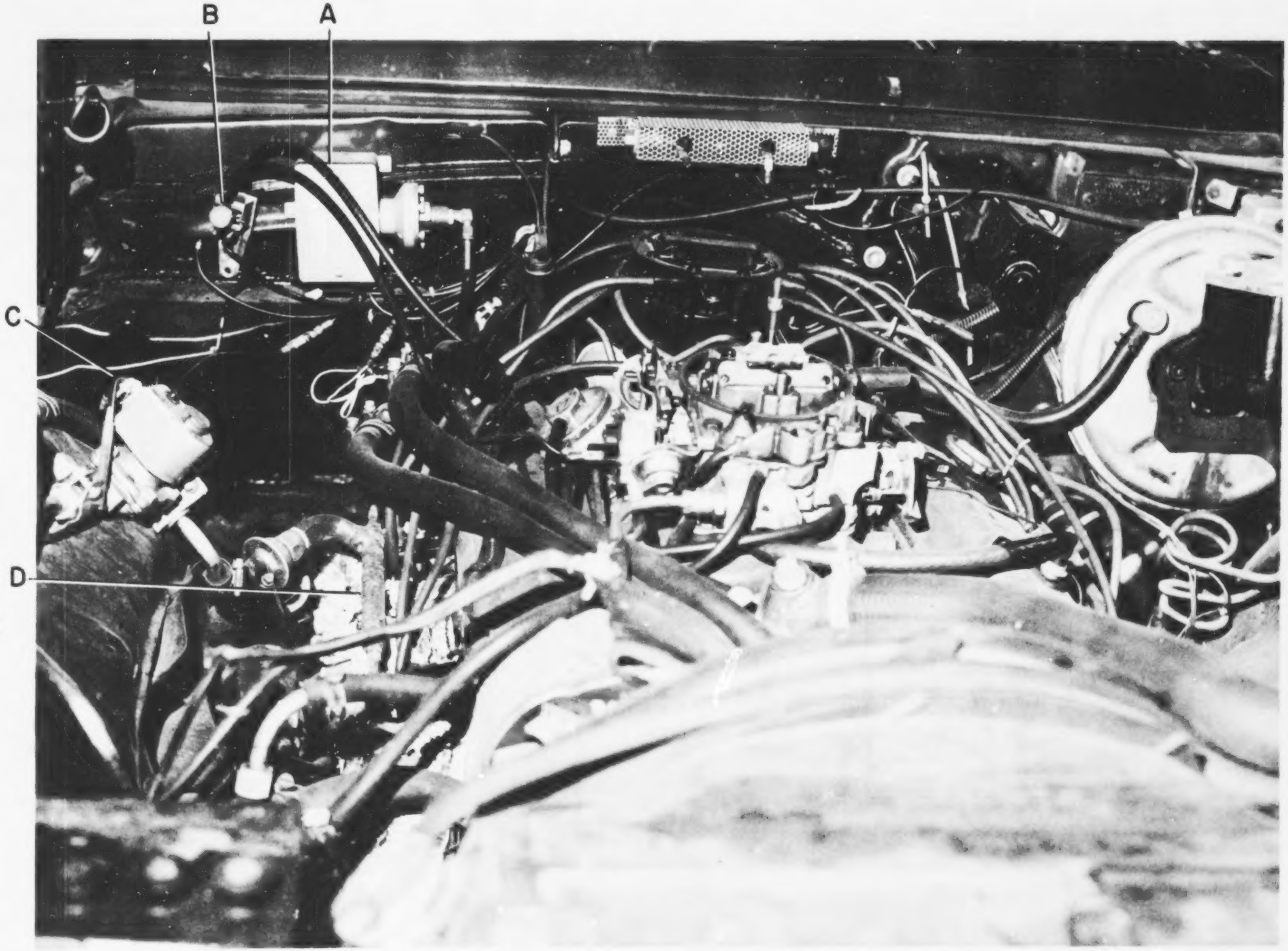
FIGURE II-16: AIR LINE SCHEMATIC

DO NOT SCALE THIS DRAWING

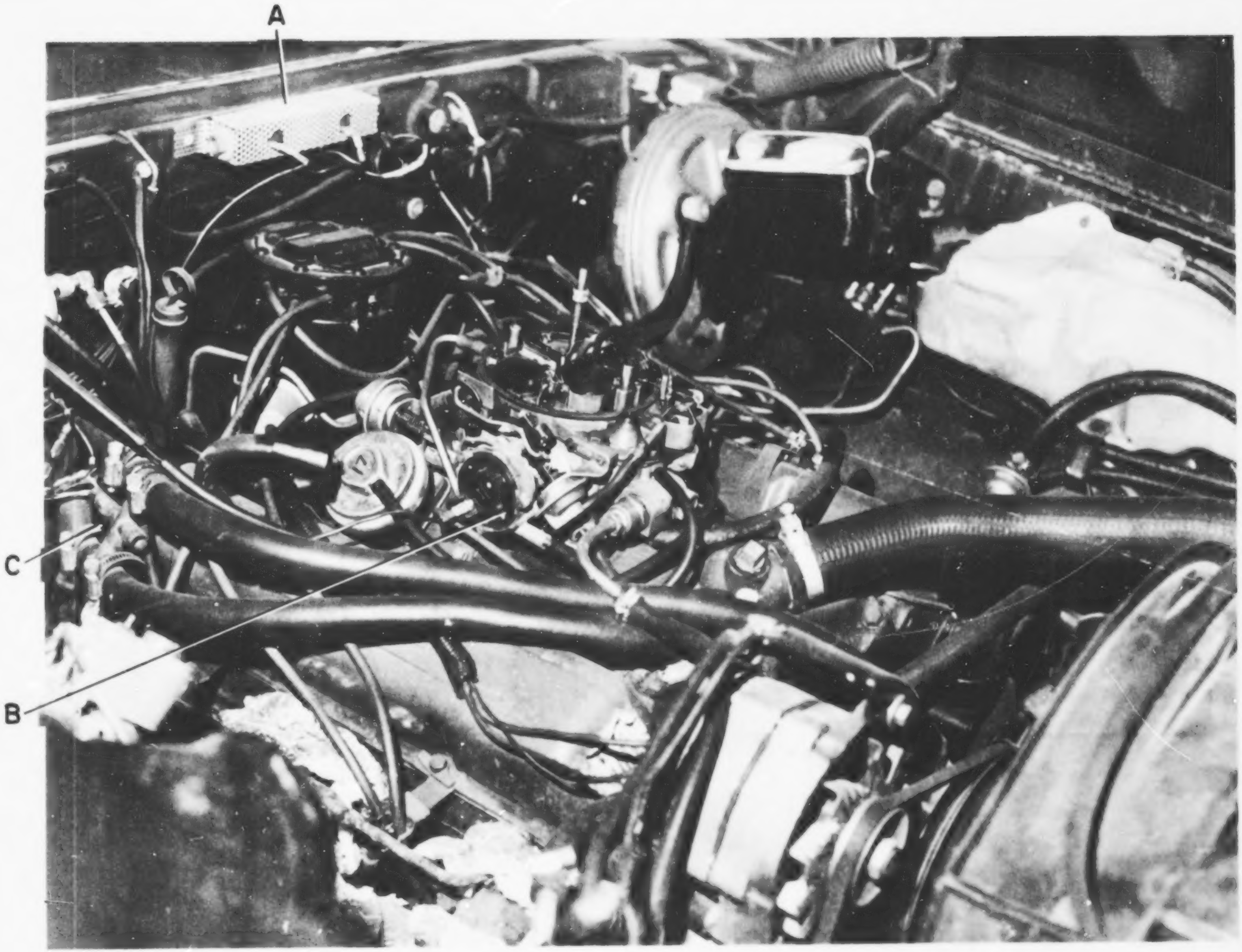

+12VDC
"ACC."
F1
4A
TD1
OMNETICS
TIME DELAY
DIALCO
12VDC 20MA
TD1-1
TS1
OPENS
160°F
PAS
ASCO SOLENOID
12VDC 11W
DIALCO
12VDC 20MA
PAS
ASCO SOLENOID
12VDC 11W
TD2
OMNETICS
TIME DELAY
TD2-1
IGNITION
RETARD

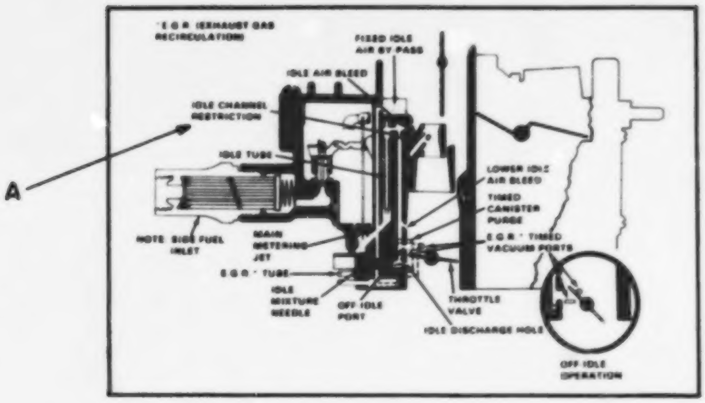
TS1=CONTROL PRODUCTS P7201-12

MATERIAL		**DRAWN** Carl W Burger **DATE** 1-19-76	**TITLE** TIMER CIRCUIT FOR EPA VEHICLES
HEAT TREAT	**SCALE**	**CHECKED** Ken W[illegible] **DATE** 1-22-76	
		DESIGN ENG. R St[illegible] **DATE** 2-4-76	
DIMENSIONAL TOLERANCES **UNLESS OTHERWISE SPECIFIED** **FRACTIONAL = ± 1/64 ANGLES ± 30'** **.XX = ± .015** **.XXX = ± .005 SURFACE MAX.** $^{63}\surd$		**ENG.** **DATE**	
		Q.A. **DATE**	**MADE FOR** R. STEINER 512610 C1/8
SQUARENESS & PARALLELISM (FLAT SURFACES)		**GOULD**	**SIZE** A
CONCENTRICITY			**DRAWING NUMBER** 76-1-19-1
			ISSUE 1

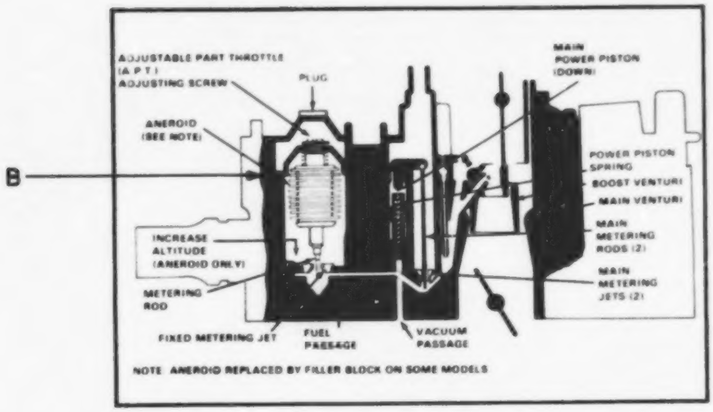


B
A
C
D

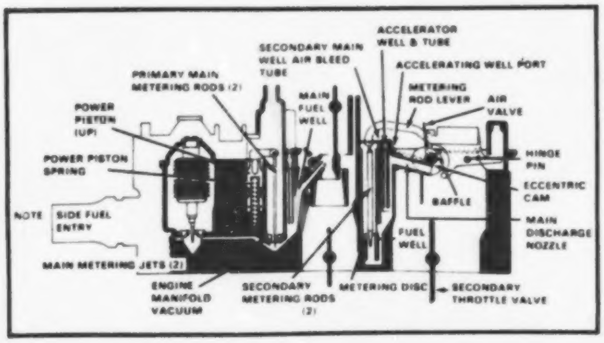

A
C
B


* E G R (EXHAUST GAS RECIRCULATION)
FIXED IDLE AIR BY PASS
IDLE AIR BLEED
IDLE CHANNEL RESTRICTION
IDLE TUBE
A
LOWER IDLE AIR BLEED
TIMED CANISTER PURGE
NOTE SIDE FUEL INLET
MAIN METERING JET
E G R * TIMED VACUUM PORTS
E G R * TUBE
IDLE MIXTURE NEEDLE
OFF IDLE PORT
THROTTLE VALVE
IDLE DISCHARGE HOLE
OFF IDLE OPERATION

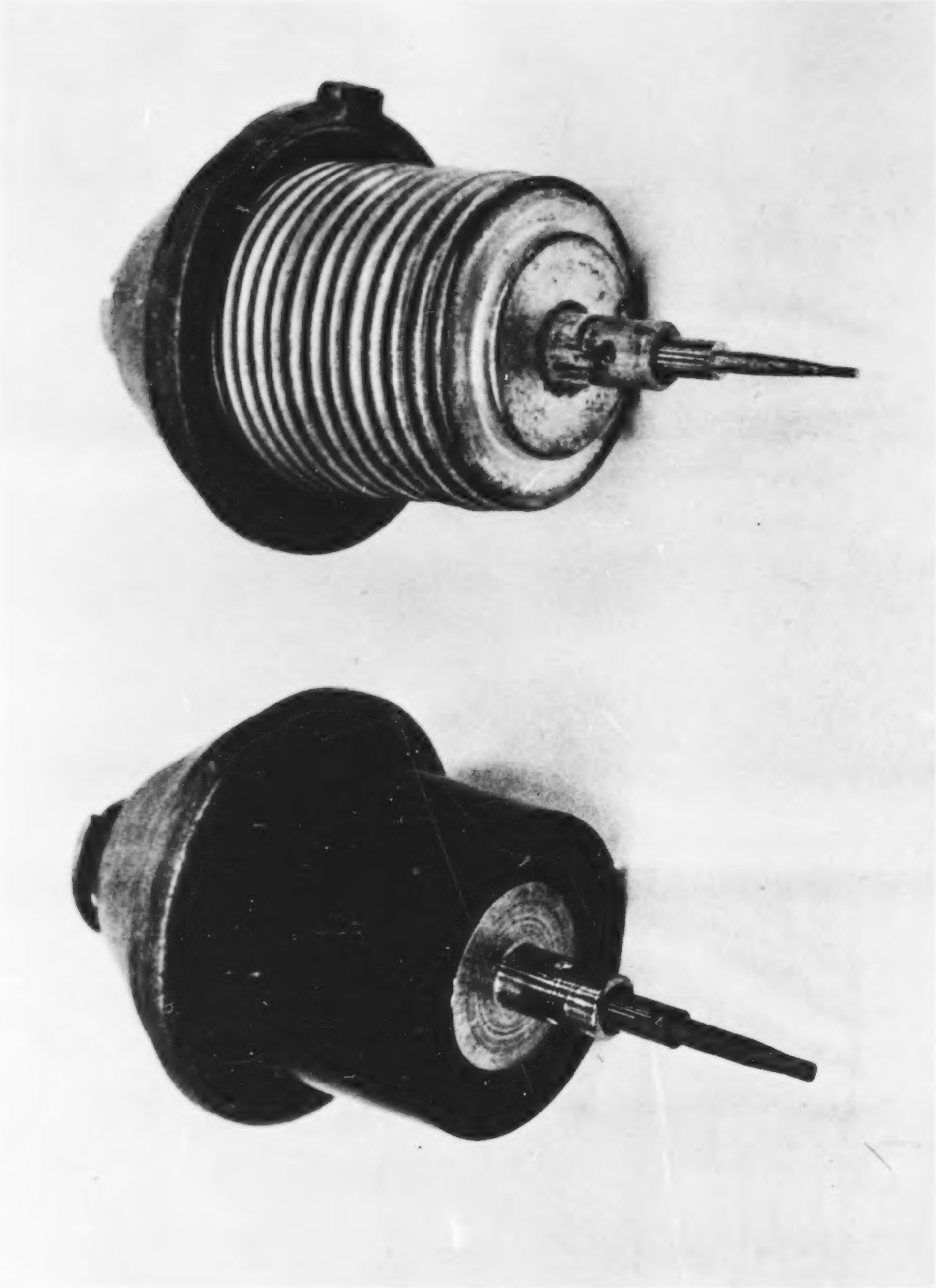
Idle System


ADJUSTABLE PART THROTTLE (A P T) ADJUSTING SCREW
PLUG
MAIN POWER PISTON (DOWN)
ANEROID (SEE NOTE)
B
POWER PISTON SPRING
BOOST VENTURI
MAIN VENTURI
INCREASE ALTITUDE (ANEROID ONLY)
MAIN METERING RODS (2)
METERING ROD
MAIN METERING JETS (2)
FIXED METERING JET
FUEL PASSAGE
VACUUM PASSAGE
NOTE ANEROID REPLACED BY FILLER BLOCK ON SOME MODELS

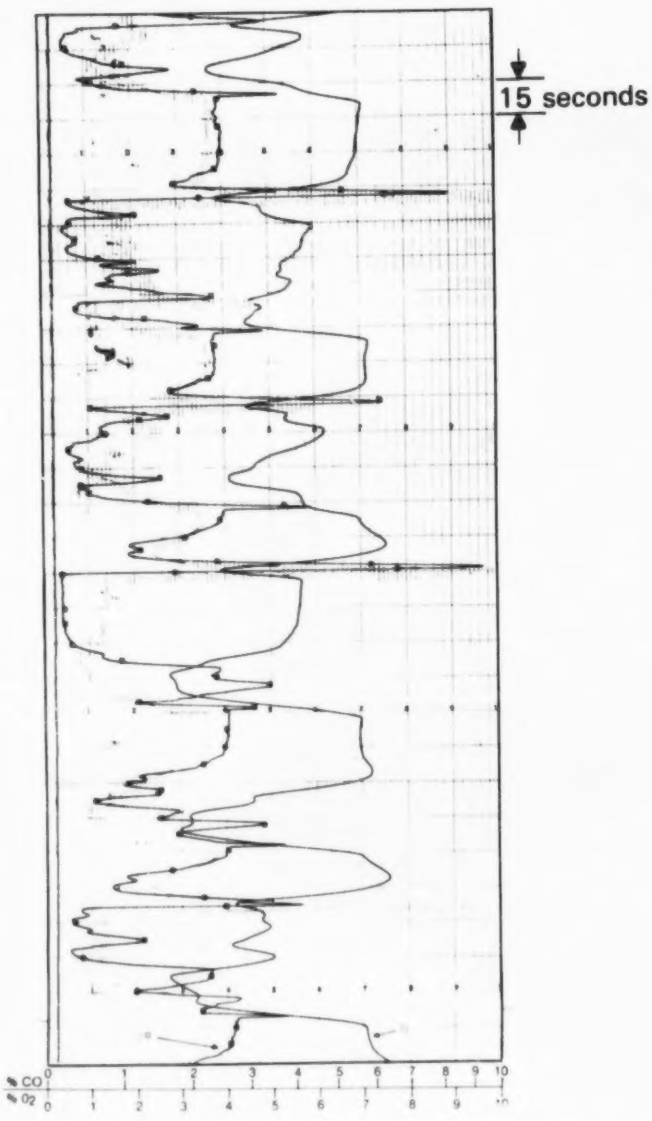
Main Metering System


ACCELERATOR WELL & TUBE
SECONDARY MAIN WELL AIR BLEED TUBE
ACCELERATING WELL PORT
PRIMARY MAIN METERING RODS (2)
METERING ROD LEVER
AIR VALVE
MAIN FUEL WELL
POWER PISTON (UP)
HINGE PIN
POWER PISTON SPRING
ECCENTRIC CAM
BAFFLE
NOTE SIDE FUEL ENTRY
MAIN DISCHARGE NOZZLE
FUEL WELL
MAIN METERING JETS (2)
ENGINE MANIFOLD VACUUM
SECONDARY METERING RODS (2)
METERING DISC
SECONDARY THROTTLE VALVE

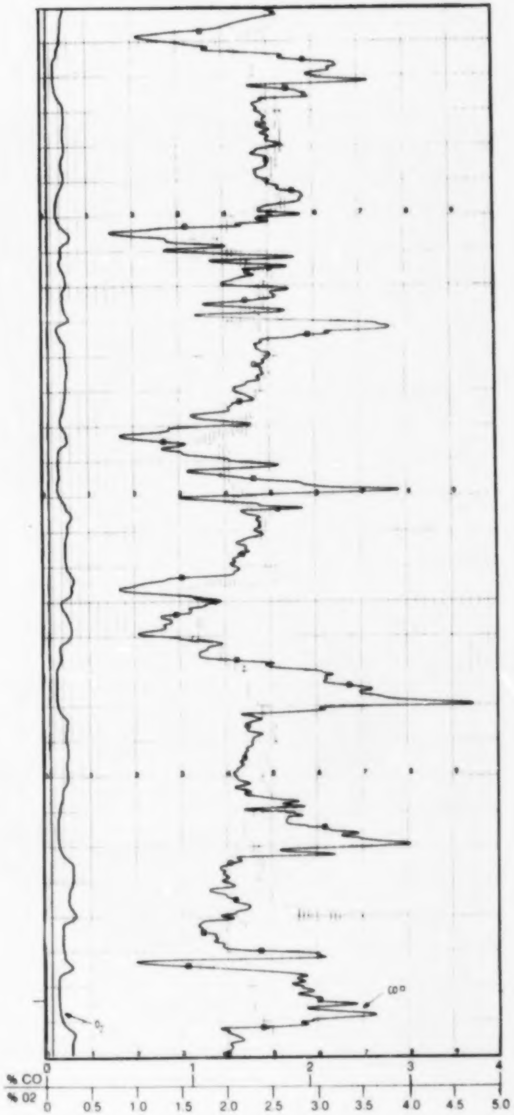
Power System



UNMODIFIED QUADRAJET



MODIFIED QUADRAJET



NOTE: Different scales used on graphs

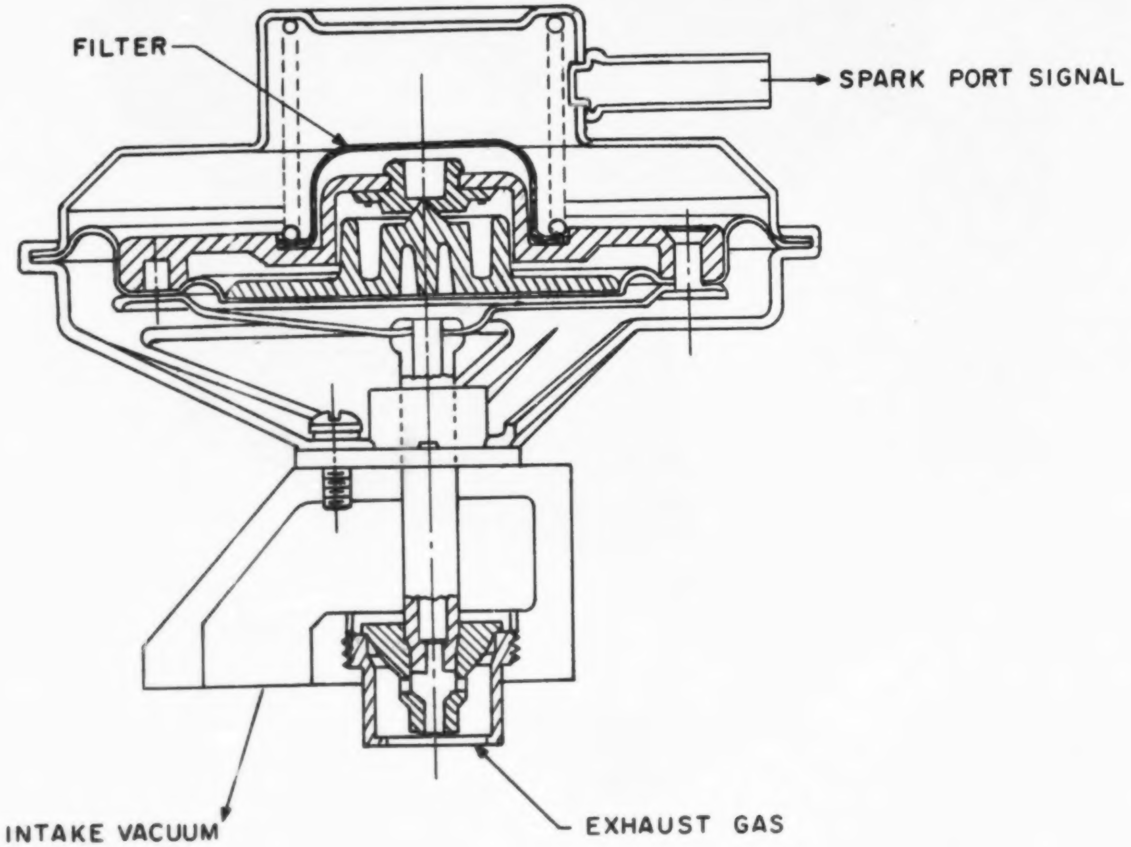
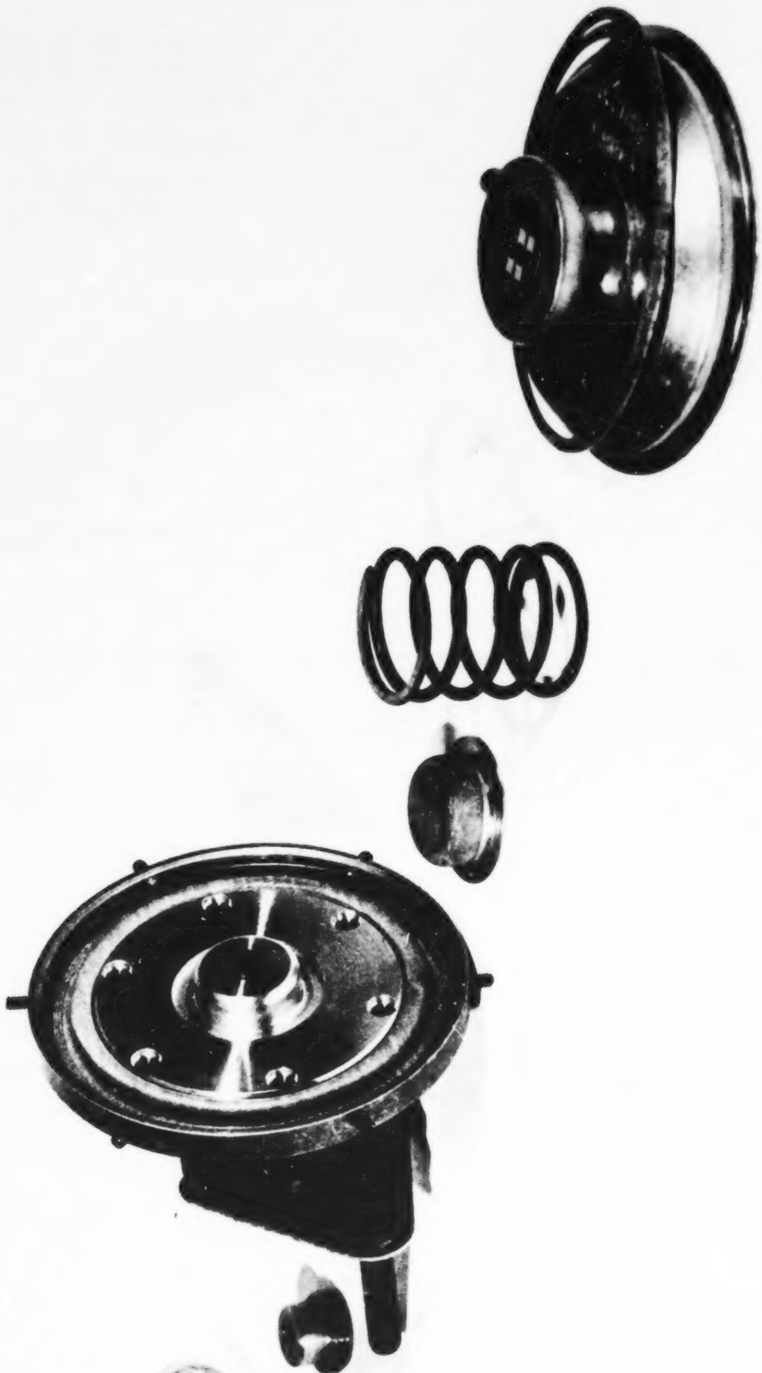

FILTER
SPARK PORT SIGNAL
INTAKE VACUUM
EXHAUST GAS

FIGURE III-4: BACKPRESSURE EGR VALVE CROSSECTION

EN 24



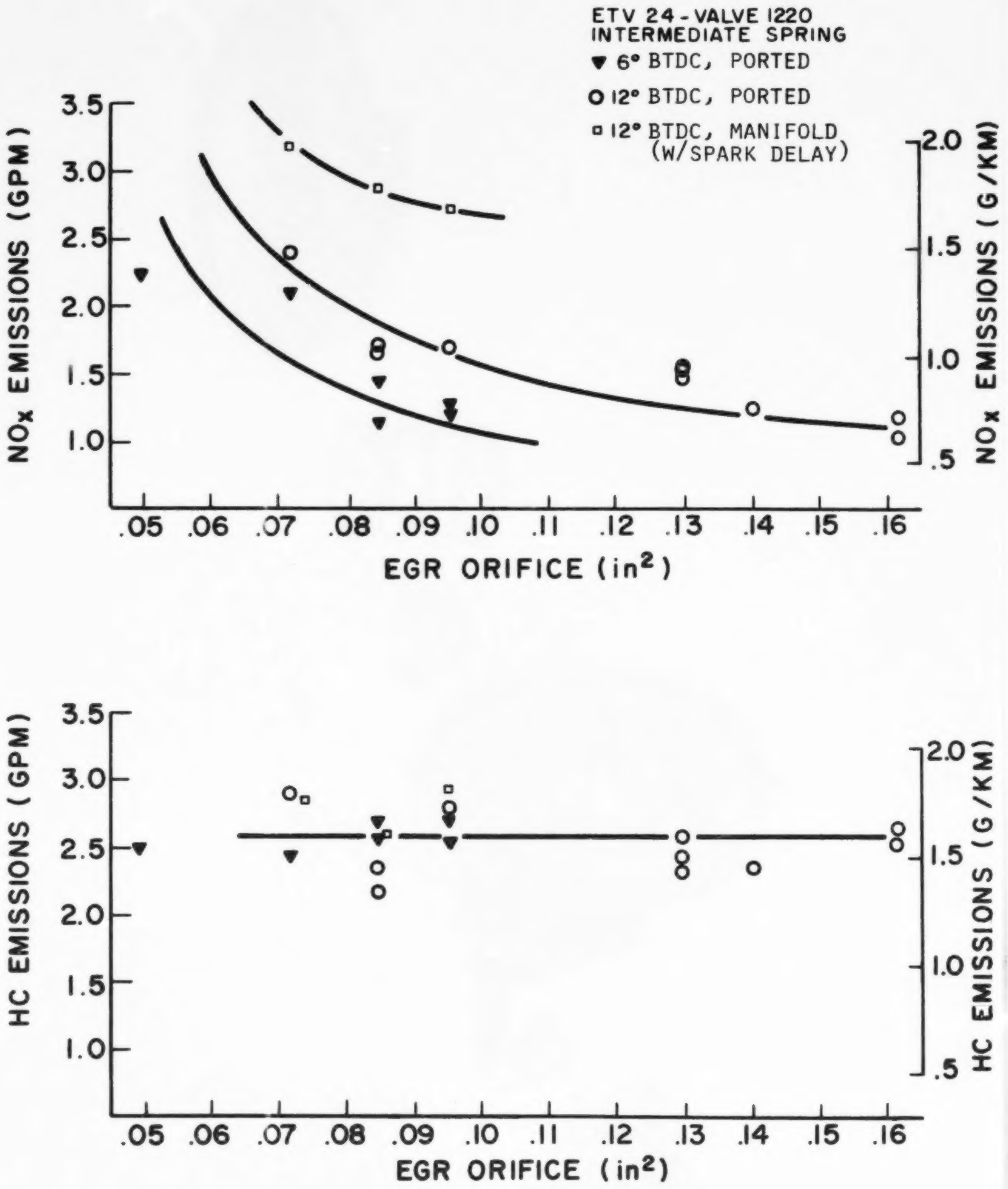
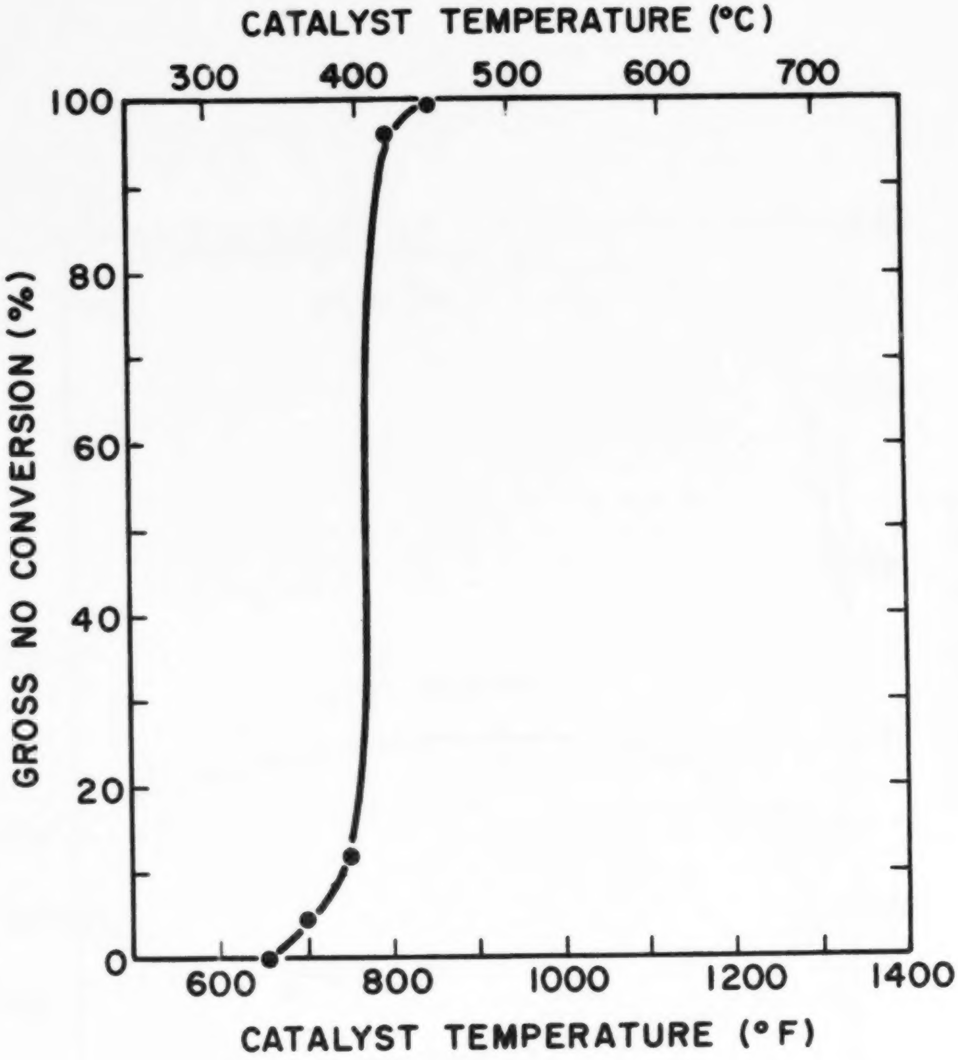


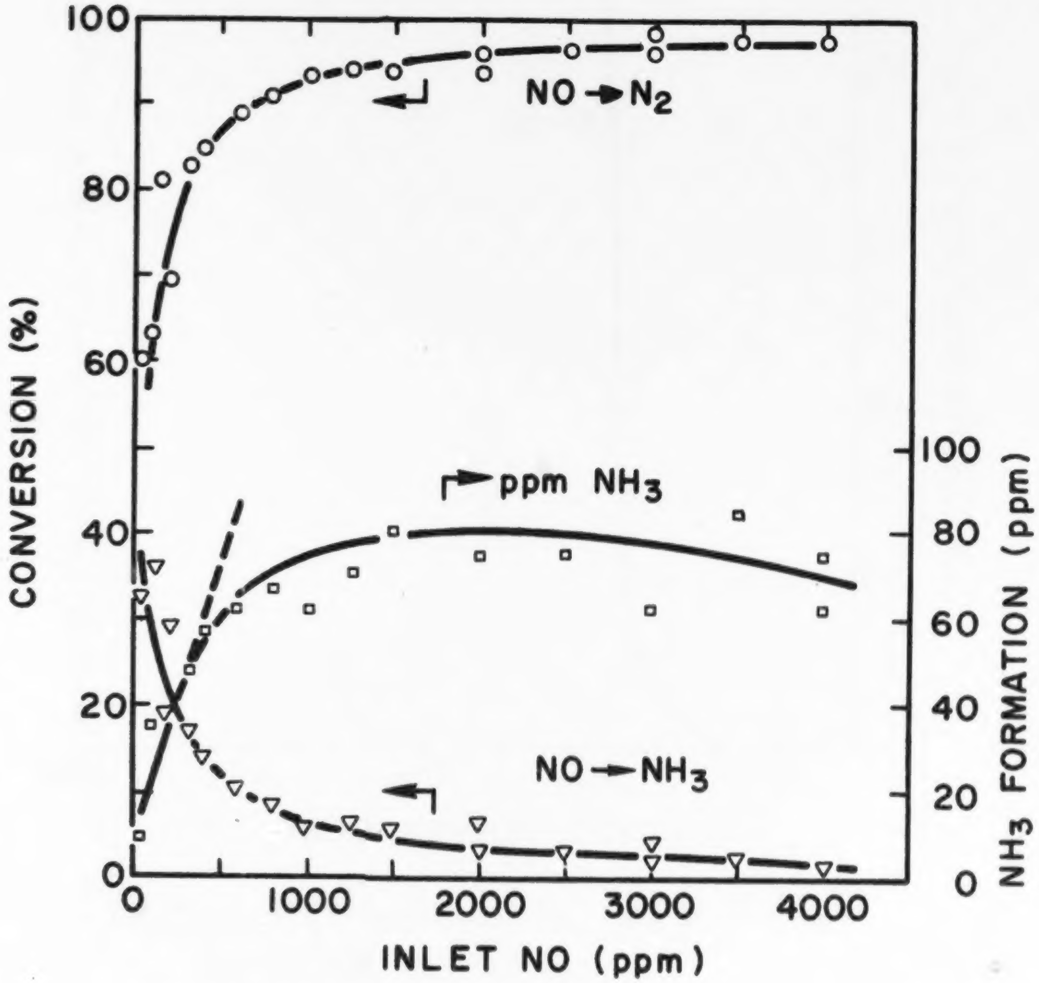
FIGURE III-7: EGR & SPARK TIMING EFFECTS ON ENGINE EMISSIONS. (HOT 505 CYCLES)



FEEDSTREAM: NO(1000 ppm), H_2 (0.5 %), CO(2% in N_2)

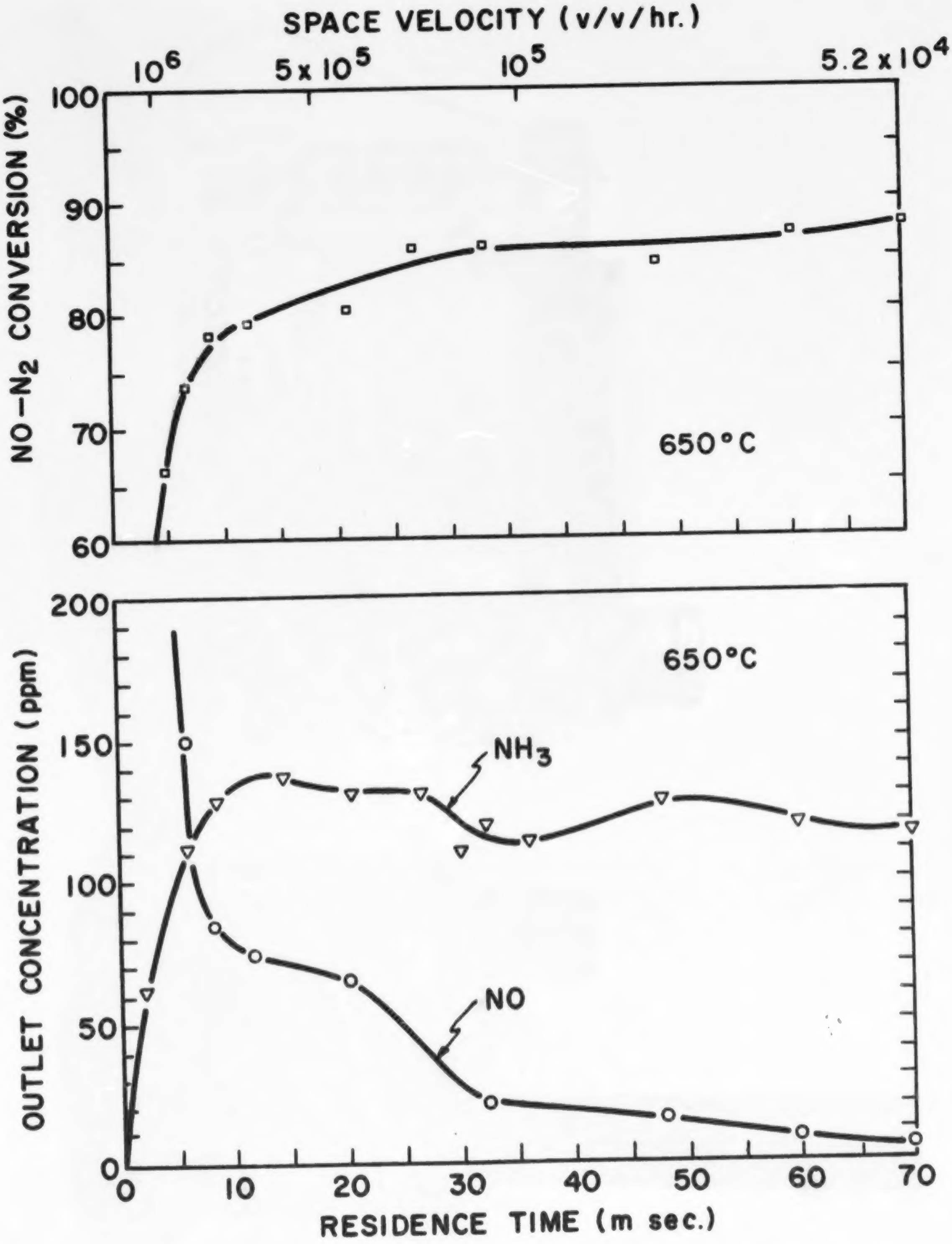
SPACE VELOCITY: 10^5 v/v/hr.

FIGURE III-8: CHARACTERISTIC TEMPERATURE BEHAVIOR OF GEM 68.



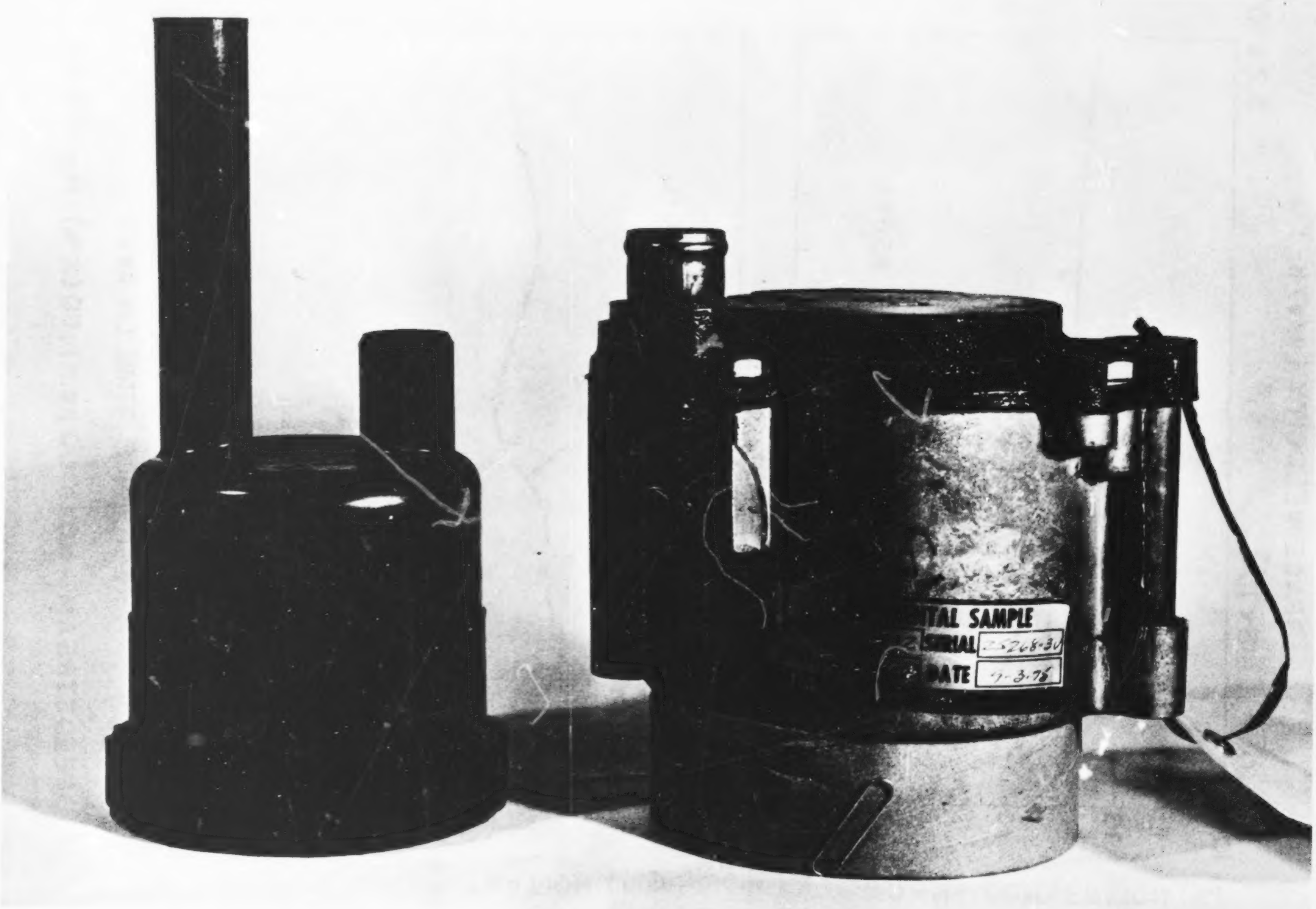
FEEDSTREAM: REGULAR EXHAUST GAS
CONTAINING NO OXYGEN
CONDITIONS: 1200°F AND 10^5 v/v/hr

FIGURE III-9: EFFECT OF INLET NO ON GEM 68 NO REDUCTION AND NH_3 FORMATION.



FEEDSTREAM: NO (1000 ppm), CO (2%), H_2 (0.5%)

FIGURE III-10: RESIDENCE TIME EFFECTS ON GEM 68.


TAL SAMPLE
SERIAL 25268-3U
DATE 7-3-75

77<

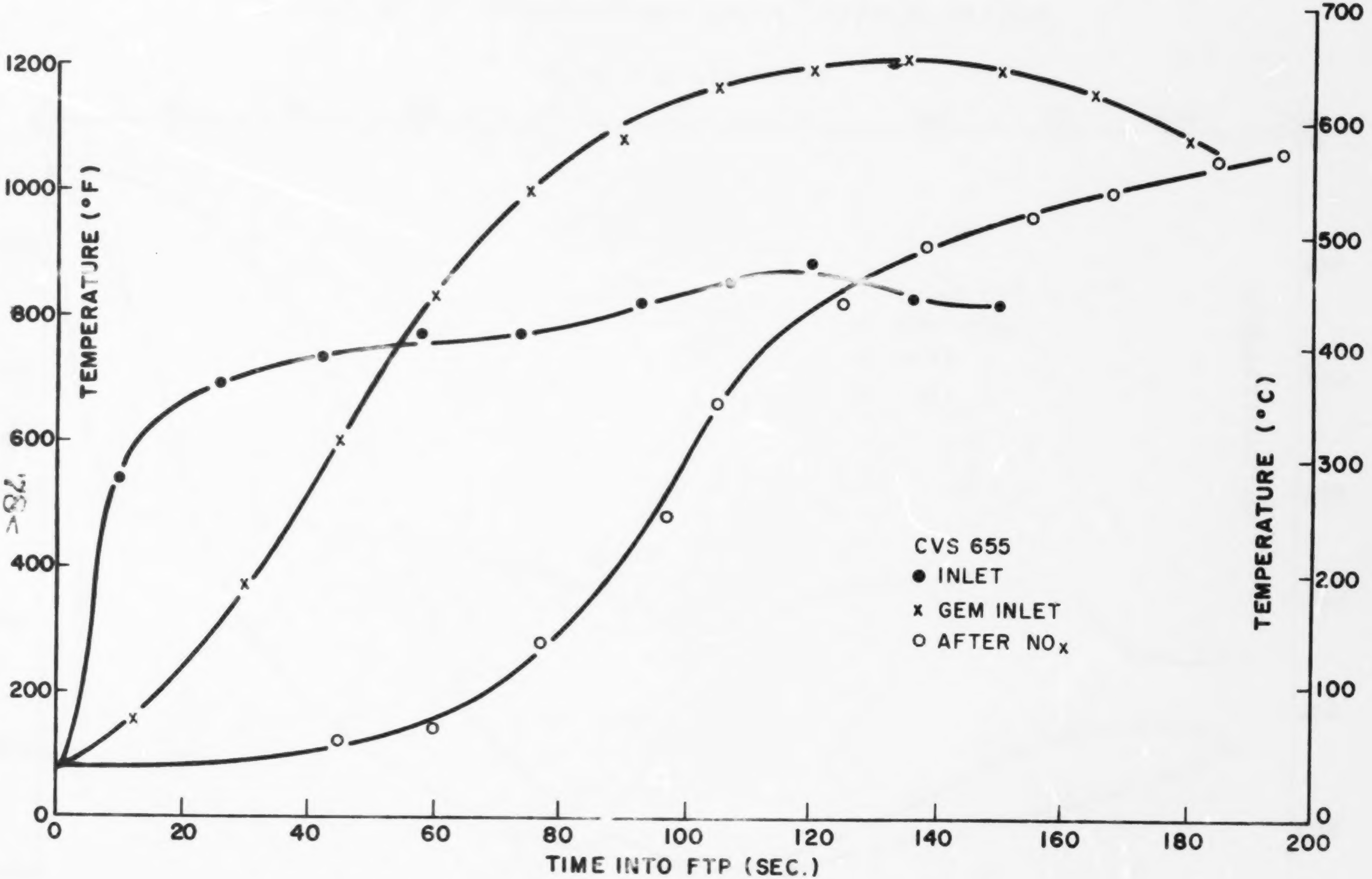


FIGURE III-12: TEMPERATURES FOR 5" CATALYST SYSTEM.

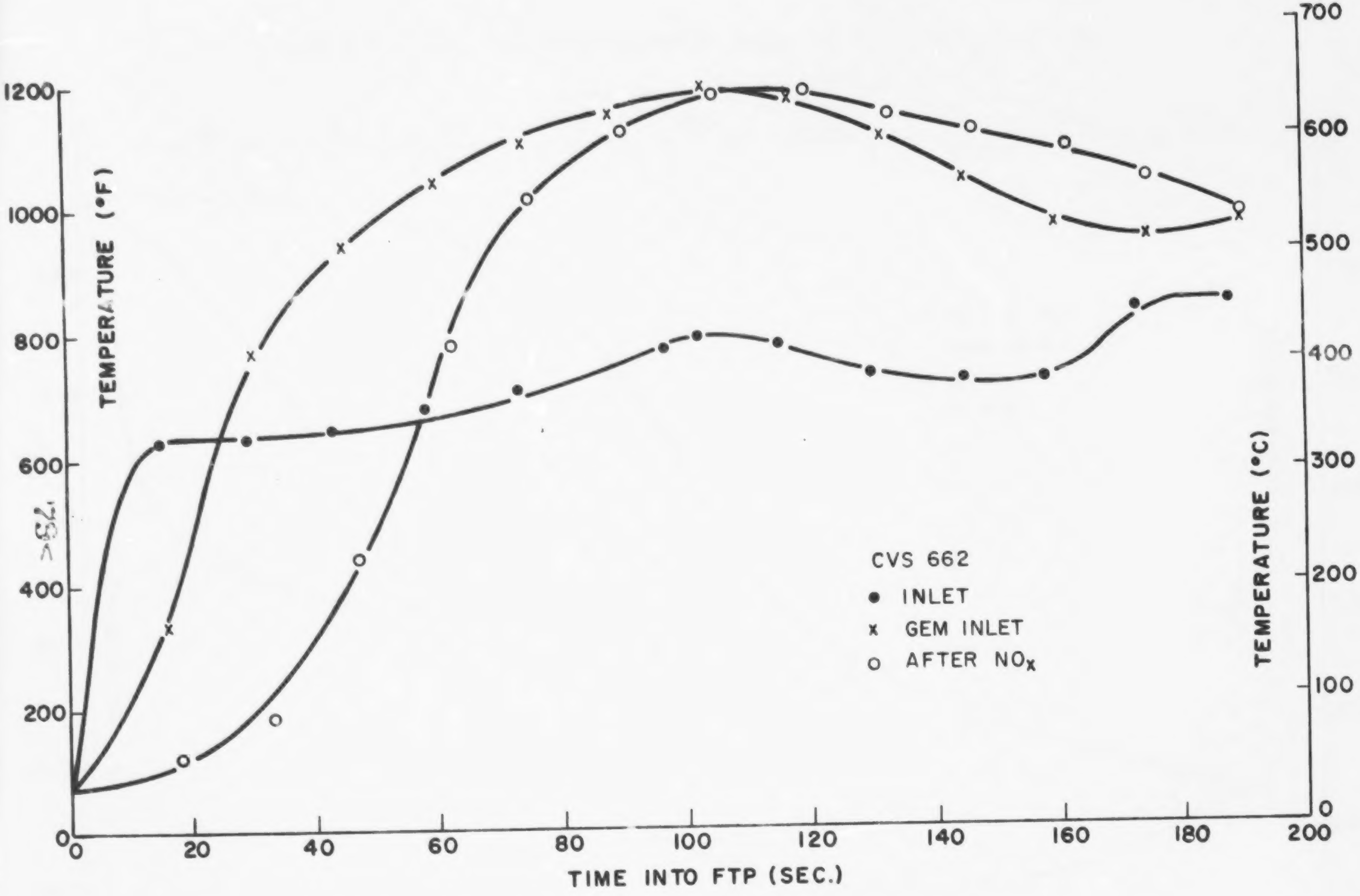


FIGURE III-13: TEMPERATURES FOR 4" CATALYST SYSTEM.

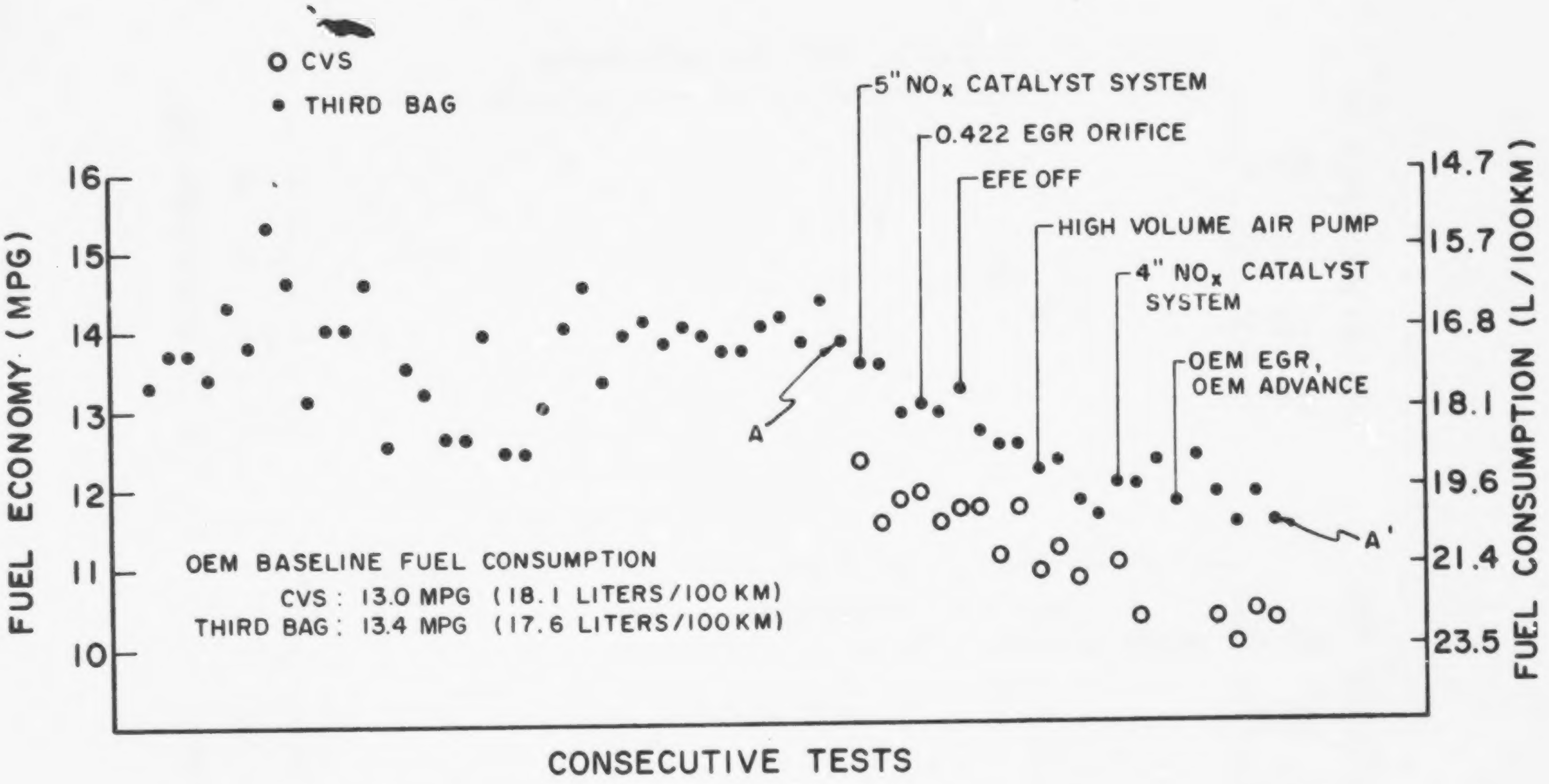


FIGURE III-14: THIRD BAG & CVS FUEL ECONOMY TRENDS FOR ETV 24.

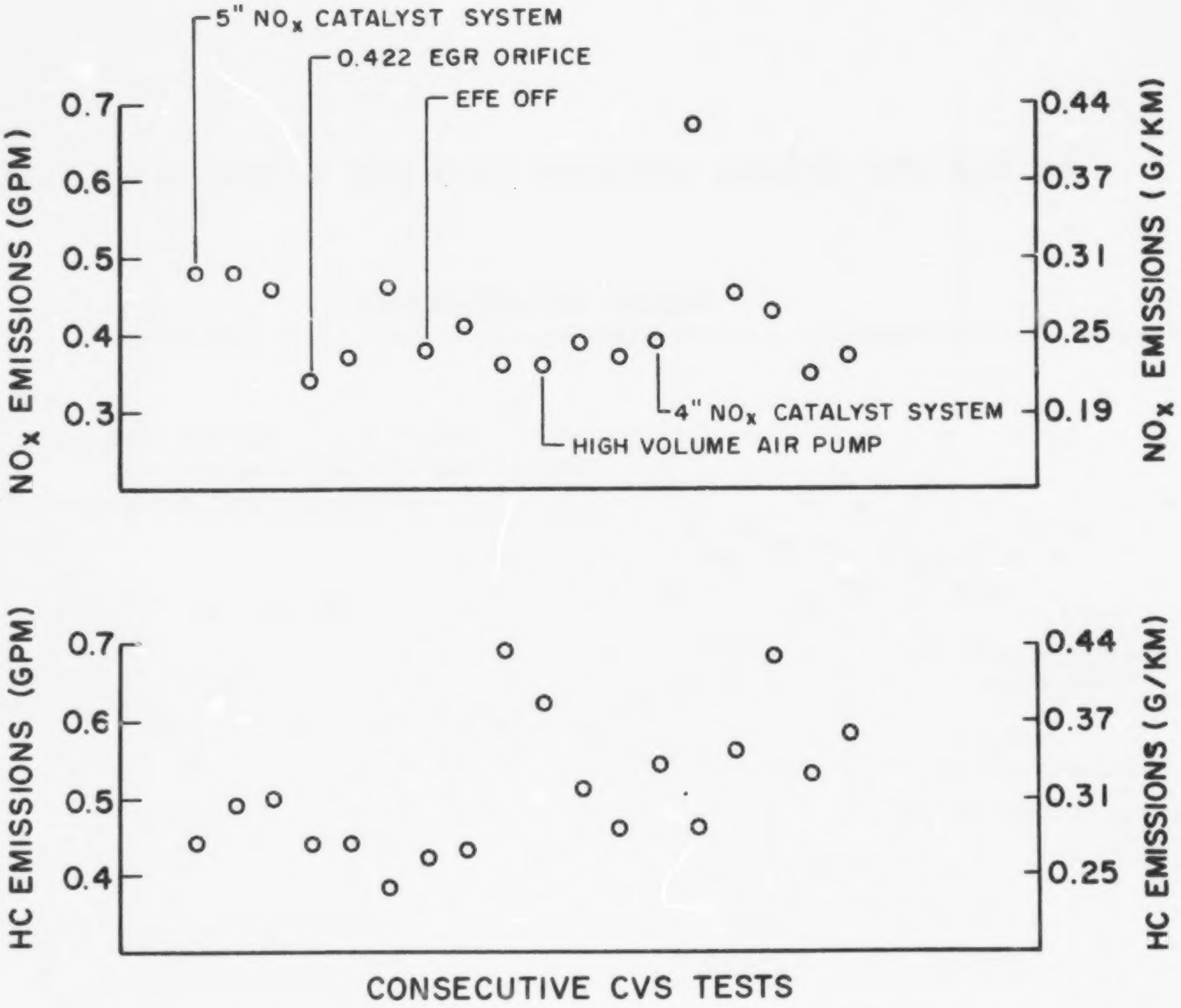


FIGURE III-15: CVS EMISSION TRENDS FOR ETV 24

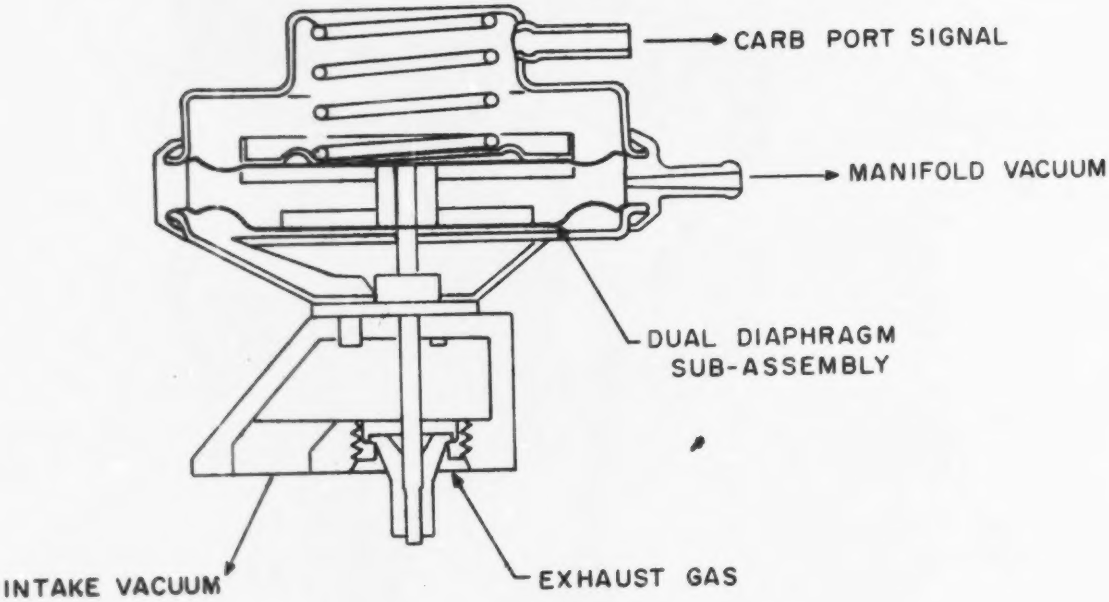

CARB PORT SIGNAL
MANIFOLD VACUUM
DUAL DIAPHRAGM SUB-ASSEMBLY
INTAKE VACUUM
EXHAUST GAS

FIGURE III-16: DUAL DIAPHRAGM EGR VALVE (CROSSECTION)

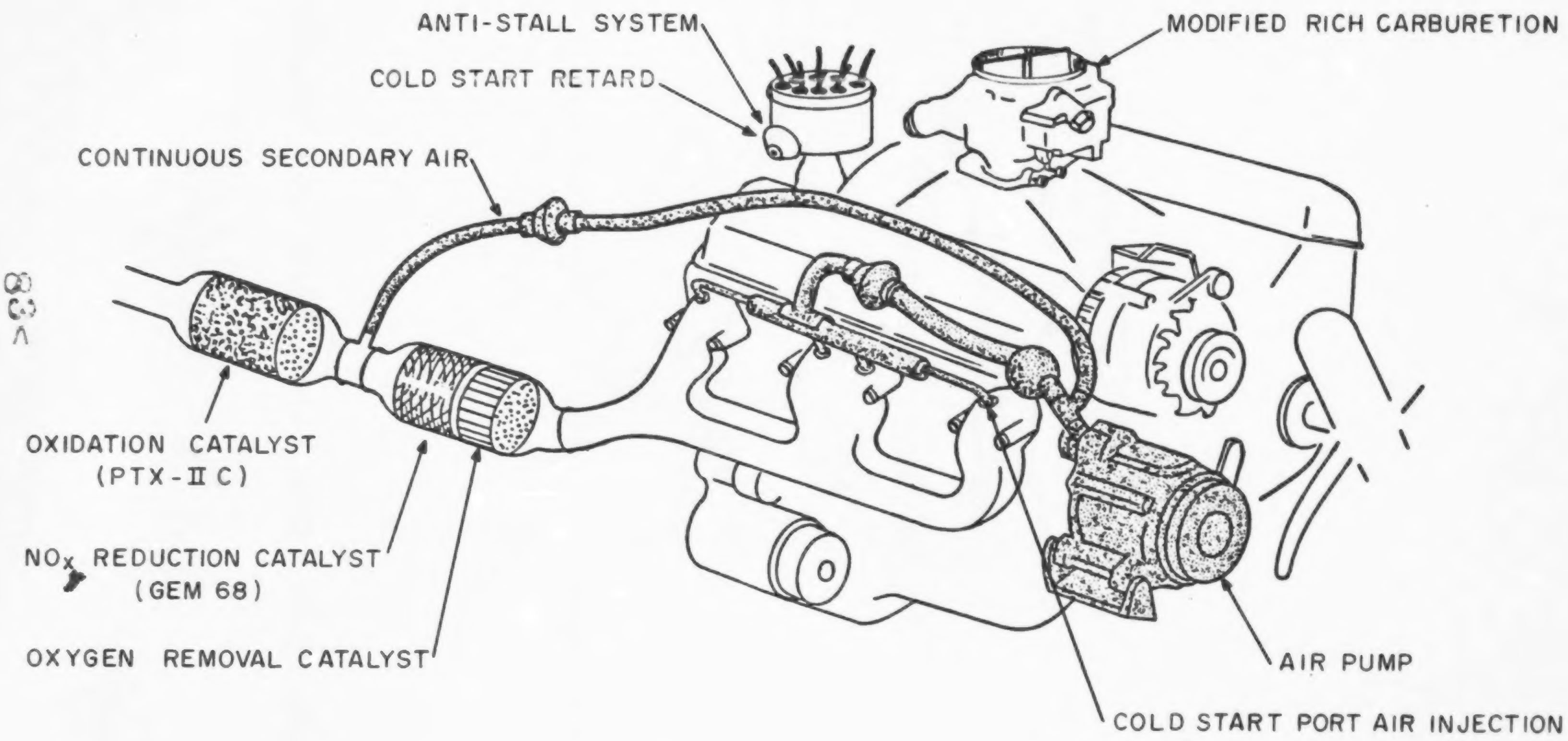

ANTI-STALL SYSTEM
COLD START RETARD
CONTINUOUS SECONDARY AIR
MODIFIED RICH CARBURETION
OXIDATION CATALYST (PTX-II C)
NO_x REDUCTION CATALYST (GEM 68)
OXYGEN REMOVAL CATALYST
AIR PUMP
COLD START PORT AIR INJECTION

FIGURE III-17: SYSTEM DESCRIPTION - ETV 25

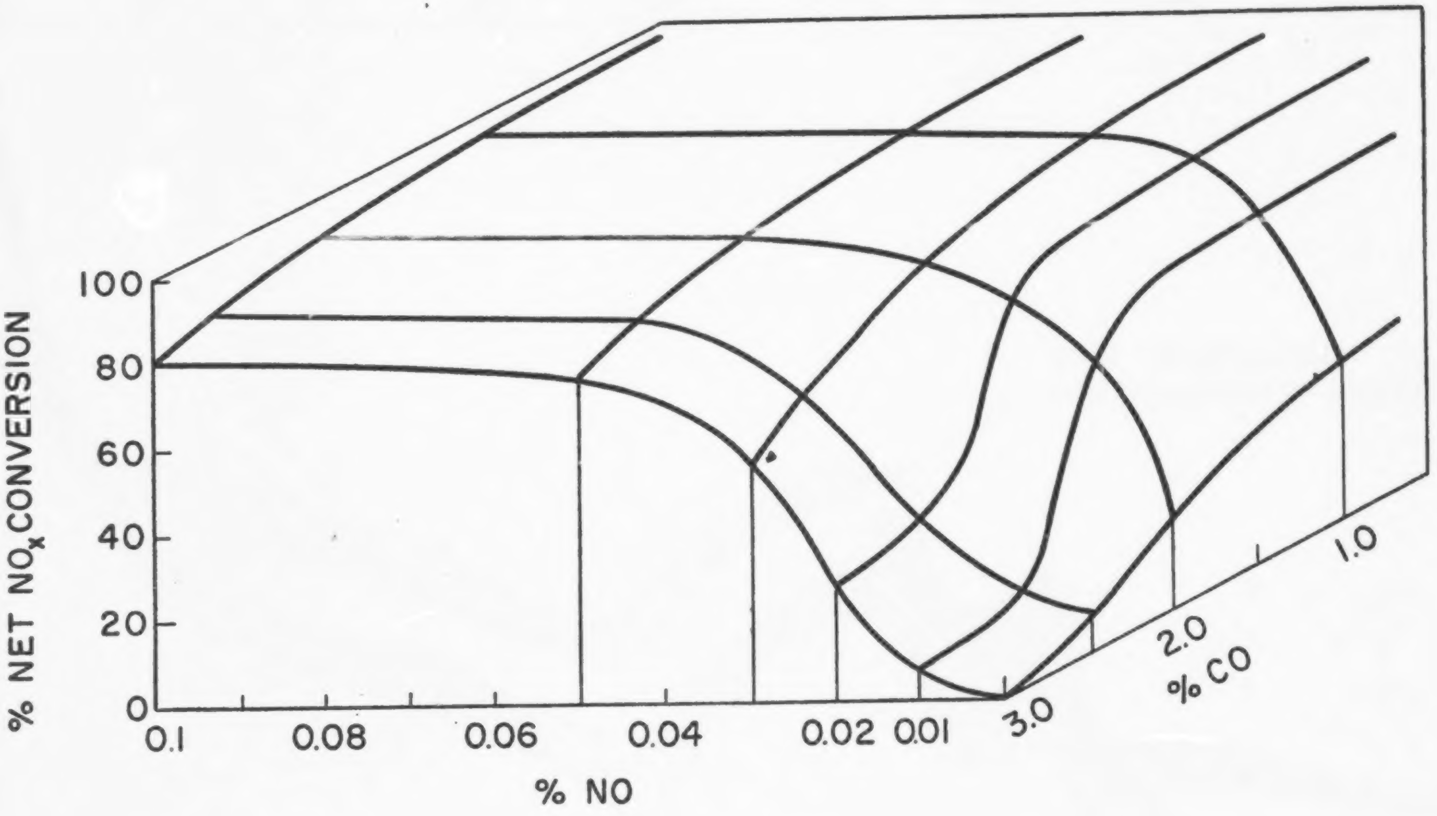


FIGURE III-18 : RELATIONSHIP OF NO AND CO ON NET NO_x EFFICIENCY.
(TEMP. = 590° C)

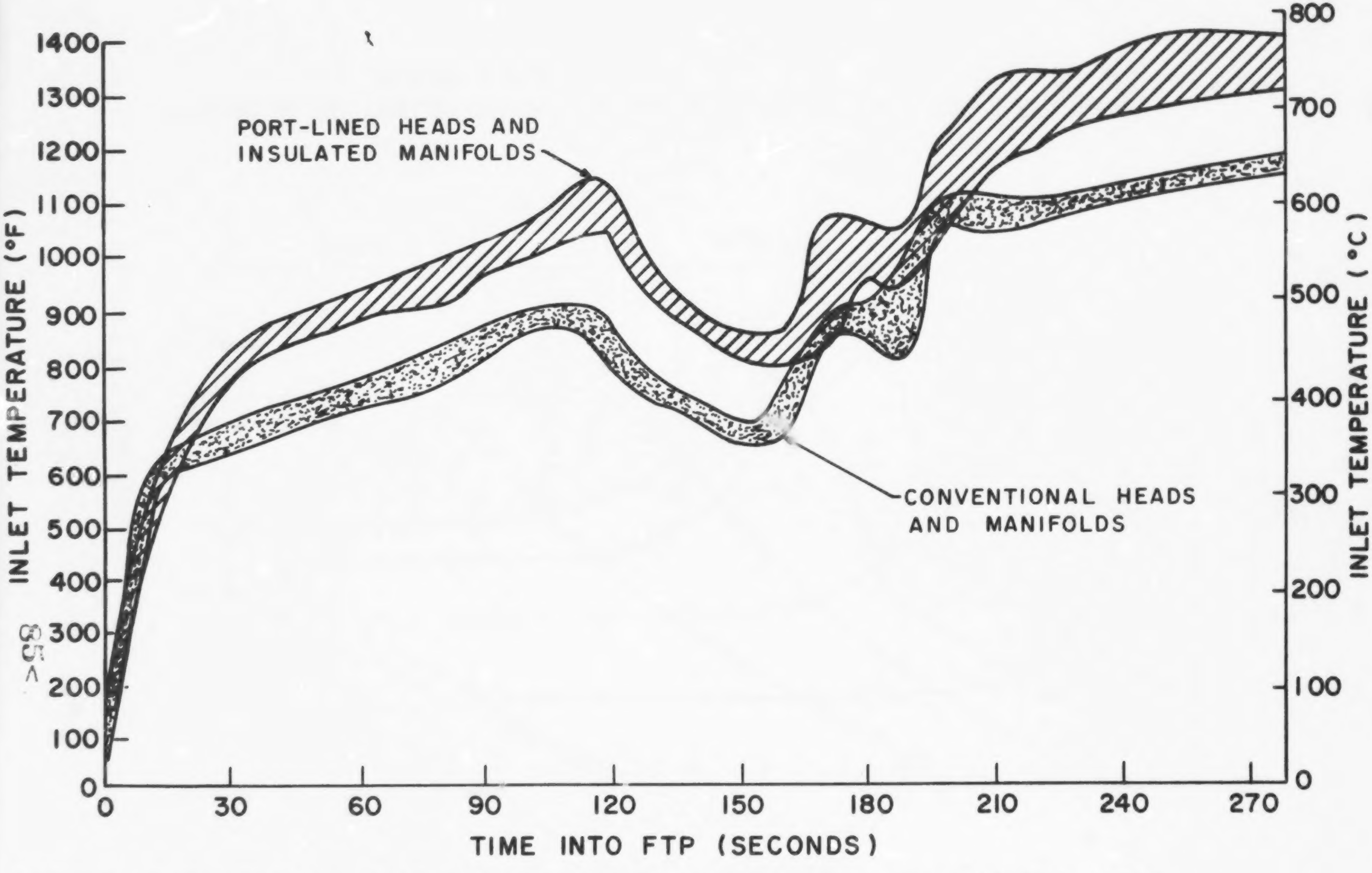


FIGURE III-19: CATALYST INLET TEMPERATURE COMPARISON FOR VARIOUS HEAT CONSERVATION TECHNIQUES.

TABLES

TABLE I-1

VEHICLE IDENTIFICATION

VEHICLE IDENTIFICATION	VIN	COLOR	WEIGHT
24	1X27L5L119711	Maroon	3500 Lbs
25	1X27L5L115781	Blue	3540 Lbs
26	1X27L5L115735	Yellow	3480 Lbs

TABLE I-2

VEHICLE BREAK IN FUEL CONSUMPTION

VEHICLE IDENTIFICATION	MILES	FUEL CONSUMPTION
24	2800	14.6 liters/100 km
25	2600	14.7 liters/100 km
26	2800	16.2 liters/100 km

TABLE I-3

VEHICLE BASELINE & CERTIFICATION DATA

VEHICLE IDENTIFICATION	FTP EMISSIONS - G/KM -			FTP FUEL CONSUMPTION - L/100 KM -		HIGHWAY FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME	CARBON	VOLUME
CERTIFICATION	2.67	0.37	1.12	18.1	--	14.7	--
24	1.25	0.29	1.37	18.1	18.8	14.4	13.8
25	1.63	0.29	1.06	17.8	18.5	14.2	13.3
26	1.35	0.30	0.90	18.8	19.0	15.1	13.9
1975 CALIFORNIA STANDARDS	5.59	0.56	1.24	--	--	--	--

TABLE I-4

1975 FTP BASELINE TESTS

VEHICLE IDENTIFICATION	FTP EMISSIONS - G/KM -			FTP FUEL CONSUMPTION - L/100 KM -		HIGHWAY FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME	CARBON	VOLUME
ETV 24							
CVS 582	0.96	0.30	1.24	17.5	19.0	14.5	13.9
CVS 584	1.55	0.32	1.41	17.9	18.7	14.7	13.9
CVS 587	1.22	0.24	1.45	18.7	18.9	14.1	13.7
ETV 25							
CVS 588	1.63	0.28	0.94	18.2	19.1	15.2	13.5
CVS 595	1.11	0.34	0.94	18.0	18.1	13.6	13.1
CVS 597	1.30	0.28	0.83	17.2	18.2	14.1	13.4
ETV 26							
CVS 589	1.45	0.84*	1.07	18.8	19.2	15.5	14.4
CVS 590	1.32	0.22	1.11	19.0	18.8	14.8	13.7
CVS 592	2.13	0.34	0.99	18.7	18.7	15.0	13.6

*Not Included in Average

TABLE III-1

TYPICAL MODIFIED CARBURETOR SPECIFICATIONS

ITEM	VEHICLE 24	 25	 26
MAIN JET ORIFICE (MM)	1.83	1.83	1.78
METERING ROD DIAMETER (MM)	1.12	1.01	0.97
CHANNEL RESTRICTOR (MM)	1.65	1.63	1.55
IDLE TUBE OPENING (MM)	0.71	0.66	0.71
CHOKE BREAK:			
FRONT (MM)	5.08	5.97	5.72
REAR (MM)	4.45	4.83	4.83

TABLE III-2

EFFECT OF OUTER EGR CONTROL SPRING ON EMISSIONS & FUEL CONSUMPTION

SPRING DESCRIPTION	HOT TRANSIENT BAG (BAG 3)				
	EMISSIONS - G/KM -			FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME
WEAK	26.5	1.52	1.40	17.2	17.7
INTERMEDIATE	28.1	1.55	1.37	17.2	18.1
STIFF	28.1	1.43	1.35	17.6	17.8
BASELINE	--	--	1.77	17.6	--

TABLE III-3

EFFECT OF IGNITION SYSTEMS ON EMISSIONS & FUEL CONSUMPTION

DESCRIPTION			HOT TRANSIENT (BAG 3)				
			EMISSIONS - G/KM -			FUEL CONSUMPTION - L/100 KM -	
TEST ID	IGNITION SYSTEM	VACUUM ADVANCE	CO	HC	NOx	CARBON	VOLUME
TB 9	BREAKER	PORTED	21.6	2.02	1.10	16.1	17.2
TB 12	HEI	PORTED	21.7	1.79	1.47	16.8	17.7
TB 8A	BREAKER	MANIFOLD W/SDV	20.2	2.54	1.72	15.4	16.3
TB 13	HEI	MANIFOLD W/SDV	20.0	1.78	1.98	16.1	16.9

INITIAL TIMING = 12 BTDC
SDV = SPARK DELAY VALVE

TABLE III-4

EFFECT OF SPARK ADVANCE & EGR ON HOT TRANSIENT EMISSIONS & FUEL CONSUMPTION

	DESCRIPTION			HOT TRANSIENT (BAG 3)				
				EMISSIONS - G/KM -			FUEL CONSUMPTION - L/100 KM -	
TEST ID	EGR ORIFICE - MM -	INITIAL TIMING -°BTDC-	VACUUM ADVANCE SCHEME	CO	HC	NOx	CARBON	VOLUME
BASELINE	--	6	MANIFOLD	--	--	1.83	17.6	--
TB 3	6.35	6	PORT	28.1	1.55	1.37	17.2	18.1
TB 14	7.67	6	PORT*	25.2	1.57	0.93	18.8	18.7
TB 15		12	PORT*	20.4	1.60	1.05	17.4	18.0
TB 10		6	PORT	21.8	1.51	1.29	18.0	18.1
TB 12		12	PORT	21.7	1.79	1.47	16.8	17.7
TB 11		6	MANIFOLD*	22.9	1.68	1.52	16.8	17.3
TB 13		12	MANIFOLD*	20.0	1.78	1.98	16.1	16.9
TB 26	8.33	6	PORT	23.9	1.58	0.70	16.9	19.0
TB 20		6	PORT	20.8	1.65	0.89	19.0	19.1
TB 16		12	PORT*	18.2	1.30	0.98	17.8	18.2
TB 28		12	PORT*	20.3	1.60	1.21	17.0	17.2
CVS 636		12	PORT*	20.2	1.43	1.33	16.8	17.0
TB 17		12	PORT	17.7	1.35	1.04	18.7	18.4
TB 18		12	PORT	20.3	1.45	1.04	18.7	18.7
TB 27		12	PORT	18.2	1.49	1.26	16.7	17.2
TB 19		12	MANIFOLD*	18.7	1.60	1.78	16.9	17.0
TB 21	8.84	6	PORT	31.0	1.58	0.75	19.0	19.3
TB 25		6	PORT	22.3	1.67	0.77	17.7	19.0
TB 22		12	PORT	26.0	1.73	1.05	18.1	18.7
TB 23		12	MANIFOLD*	24.6	1.83	1.70	16.8	17.0
TB 24		12	MANIFOLD	19.9	1.77	1.77	16.2	16.8
CVS EXP 2	10.31	12	PORT	18.3	1.44	0.91	17.2	17.4
CVS 737		12	PORT	18.6	1.50	0.94	16.8	17.0
CVS EXP 3		12	PORT	20.2	1.60	0.96	16.7	17.2
CVS 638	10.72	12	PORT	19.4	1.46	0.77	17.0	17.7
TB 29	11.51	12	PORT	20.5	1.57	0.64	17.2	18.1
CVS EXP		12	PORT	20.8	1.63	0.73	16.9	17.7

*SPARK DELAY VALVE

TABLE III-5

EFFECT OF SPARK ADVANCE & EGR ON COLD STABILIZED EMISSIONS & FUEL CONSUMPTION

	DESCRIPTION			COLD STABILIZED (BAG 2)				
				EMISSIONS - G/KM -			FUEL CONSUMPTION - L/100 KM -	
TEST ID	EGR ORIFICE - MM -	INITIAL TIMING -°BTDC-	VACUUM ADVANCE SCHEME	CO	HC	NOx	CARBON	VOLUME
BASELINE		6	MANIFOLD	--	--	0.96	18.8	--
CVS 636	8.33	12	PORT*	28.3	1.81	0.87	19.8	20.5
CVS EXP 2	10.31	12	PORT	29.0	1.84	0.64	19.4	20.5
CVS 637		12	PORT	27.0	1.77	0.72	20.1	20.6
CVS 638	10.72	12	PORT	28.7	1.81	0.57	19.8	20.6
CVS EXP	11.51	12	PORT	31.2	2.06	0.55	19.6	20.8

*SPARK DELAY VALVE

TABLE III-6

1975 FTP RESULTS FOR 5" CATALYST SYSTEM

TEST ID	EMISSIONS - G/KM -			FUEL CONSUMPTION - L/100 KM -		COMMENTS
	CO	HC	NOx	CARBON	VOLUME	
CVS 640	0.70	0.27	0.30	19.1	19.9	SET-UP TESTS
CVS 641	3.78	0.30	0.30	20.5	21.2	" "
CVS 642	3.19	0.31	0.29	19.9	20.8	" "
CVS 643	0.30	0.27	0.21	19.8	--	" "
CVS 646	0.47	0.27	0.23	20.5	21.0	" "
CVS 649	0.83	0.24	0.29	20.1	--	" "
CVS 650	0.40	0.26	0.24	20.1	21.2	EFE DISCONNECTED
CVS 651	0.44	0.27	0.25	21.2	21.2	
CVS 652	0.85	0.43	0.22	20.1	21.0	
CVS 653	0.77	0.39	0.22	21.6	22.0	26 CID AIR PUMP
CVS 654	0.73	0.32	0.24	21.0	21.6	
CVS 655	0.70	0.29	0.23	21.8	22.2	

TABLE III-7

EFFECT OF 22 CID AIR PUMP ON VEHICLE EMISSIONS & FUEL CONSUMPTION

TEST ID	COLD STABILIZED (BAG 2)					HOT TRANSIENT (BAG 3)				
	EMISSIONS - G/KM -			FUEL CONSUMPTION - L/100 KM -		EMISSIONS - G/KM -			FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME	CO	HC	NOx	CARBON	VOLUME
STANDARD 19 CID AIR PUMP										
CVS 650	0.15	0.22	0.13	20.6	22.4	0.44	0.24	0.27	18.5	19.1
CVS 651	0.18	0.22	0.16	22.4	--	0.38	0.24	0.29	18.8	--
CVS 652	0.14	--	0.14	20.6	22.2	0.25	--	0.26	18.7	18.8
AVERAGE	0.16	0.22	0.14	21.2	22.3	0.36	0.24	0.27	18.7	18.9
22 CID AIR PUMP										
CVS 653	0.14	0.29	0.17	22.0	22.8	0.46	0.37	0.25	19.3	19.3
CVS 654	0.16	0.25	0.20	22.2	22.8	0.14	0.24	0.25	19.1	19.3
CVS 655	0.16	0.24	0.19	23.1	23.8	0.35	0.26	0.22	19.9	19.9
AVERAGE	0.15	0.26	0.19	22.4	23.1	0.32	0.29	0.24	19.4	19.5

TABLE III-8

1975 FTP RESULTS FOR 4" CATALYST SYSTEM

TEST ID	EMISSIONS - G/KM - CO	HC	NOx	FUEL CONSUMPTION - L/100 KM - CARBON	VOLUME	COMMENTS
CVS 656	0.83	0.34	0.24	21.4	21.2	SET-UP
CVS 658	0.59	0.29	0.42	22.8	22.4	"
CVS 660	2.44	0.35	0.28	22.8	22.4	"
CVS 661	1.82	0.42	0.27	23.5	22.8	
CVS 662	1.49	0.33	0.22	22.6	22.8	
CVS 663	1.49	0.36	0.23	22.8	23.8	
1978 STANDARDS	2.11	0.25	0.25	--	--	

TABLE III-9

1975 FTP RESULTS - ETV 25 REBASELINE

TEST ID	EMISSIONS - G/KM - CO	EMISSIONS - G/KM - HC	EMISSIONS - G/KM - NOx	FUEL CONSUMPTION - L/100 KM - CARBON	FUEL CONSUMPTION - L/100 KM - VOLUME	DESCRIPTION
CVS 664	1.47	0.39	0.32	24.0	23.8	RICH AFR; 12° BTDC; PVA; BPEGR-10.31MM; 26 CID PUMP
CVS 666	1.45	0.39	0.33	24.5	23.3	
CVS 671	0.98	0.33	0.54	22.4	22.6	BPEGR-7.67MM
CVS 675	1.35	0.38	0.45	22.0	22.4	1975 OE EGR
CVS 681	0.86	0.28	0.45	18.8	20.6	1975 OE INITIAL TIMING & VACUUM ADVANCE
CVS 683	1.29	0.35	0.57	21.4	21.2	
CVS 698	3.67	0.45	1.25	19.6	19.8	1975 OE EXHAUST SYSTEM; CARBURETOR; AIR PUMP
CVS 699	3.46	0.40	1.28	19.8	20.3	

TABLE III-10

COMPARISON OF ORIGINAL & REPEAT BASELINE TESTS

DESCRIPTION	FTP EMISSIONS - G/KM - CO	FTP EMISSIONS - G/KM - HC	FTP EMISSIONS - G/KM - NOx	FTP FUEL CONSUMPTION - L/100 KM - CARBON	FTP FUEL CONSUMPTION - L/100 KM - VOLUME	HIGHWAY FUEL CONSUMPTION - L/100 KM - CARBON	HIGHWAY FUEL CONSUMPTION - L/100 KM - VOLUME
ETV 24							
ORIGINAL BASELINE	1.25	0.29	1.37	18.1	18.8	14.4	13.8
REPEAT BASELINE	3.57	0.42	1.27	19.6	19.9	14.1	13.7
ETV 26							
ORIGINAL BASELINE	1.35	0.30	0.90	18.8	19.0	15.1	13.9
REPEAT BASELINE	2.54	0.50	1.05	19.8	20.3	14.3	14.3

TABLE III-11

EFFECT OF NOx CATALYSTS ON EXHAUST SYSTEM BACKPRESSURE

VEHICLE SPEED - MPH -	EXHAUST BACKPRESSURE AT EGR VALVE - KG/CM^2 -		% CHANGE
	FRESH CATALYSTS	USED CATALYSTS	
0 (DRIVE IDLE)	0.0151	0.0151	0
10	0.0165	0.0161	-2%
20	0.0156	0.0169	8%
30	0.0245	0.0267	9%
40	0.0383	0.0441	15%
50	0.0636	0.0726	14%
60	0.1024	0.1211	18%

TABLE III-12

EFFECTS OF EGR SYSTEMS ON 1975 FTP EMISSIONS & FUEL CONSUMPTION - ETV 24

	EMISSIONS - G/KM -			FUEL CONSUMPTION - L/100 KM -		
TEST ID	CO	HC	NOx	CARBON	VOLUME	SYSTEM COMMENTS
CVS 706	1.09	0.31	0.45	19.9	21.2	1975 OE EGR
CVS 720	0.94	0.72*	0.47	20.3	21.0	BPEGR: 7.67MM ORIFICE STRONG SPRING
CVS 722	0.50	0.27	0.49	20.3	21.0	
CVS 724	0.86	0.37	0.50	20.1	20.8	
CVS 730	1.03	0.26	0.35	20.7	21.9	BPEGR: 10.69MM ORIFICE STRONG SPRING
CVS 731	1.23	0.28	0.37	20.9	22.0	
CVS 738	1.15	0.25	0.78	19.4	20.6	BPEGR: 7.67MM ORIFICE STRONG SPRING
CVS 741	0.81	0.19	0.41	19.4	21.0	
CVS 742	1.12	0.22	0.45	20.3	21.0	
CVS 747	1.54	0.28	0.46	20.5	21.0	
CVS 752	1.46	0.25	0.47	20.1	20.6	
CVS 754	0.98	0.24	0.52	19.8	20.3	
CVS 711	1.42	0.31	0.29	21.6	21.2	DUAL DIAPHRAGM EGR
CVS 714	0.44	0.23	0.34	21.6	21.2	
CVS 717	0.44	0.24	0.35	19.9	21.4	
CVS 719	0.28	0.21	0.30	21.6	21.8	
CVS 751	1.28	0.30	0.29	21.4	21.8	

*STARTING PROBLEMS

TABLE III-13

ZERO MILE EMISSIONS & FUEL CONSUMPTION RESULTS - ETV 24

TEST ID	FTP EMISSIONS - G/KM -			FTP FUEL CONSUMPTION - L/100 KM -		HIGHWAY FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME	CARBON	VOLUME
755	0.48	0.21	0.49	19.6	20.3	13.8	14.3
756	0.44	0.22	0.50	19.8	20.3	13.8	14.3
760	0.55	0.25	0.53	19.8	20.1	14.2	14.5
AVERAGE	0.49	0.23	0.51	19.7	20.2	13.9	14.4

TABLE III-14

1975 FTP CALIBRATION TESTS - ETV 25

TEST ID	EMISSIONS - G/KM - CO	EMISSIONS - G/KM - HC	EMISSIONS - G/KM - NOx	FUEL CONSUMPTION - L/100 KM - CARBON	FUEL CONSUMPTION - L/100 KM - VOLUME	COMMENTS
CVS 757	0.51	0.23	0.62	18.4	19.6	BPEGR: 7.67MM ORIFICE STRONG SPRING
CVS 759	0.38	0.22	0.80	19.8	21.0	
CVS 723	0.94	0.21	0.53	17.6	20.3	
CVS 727	0.43	0.21	0.65	17.8	19.8	
CVS 733	0.62	0.28	0.48	20.3	21.8	
CVS 748	0.47	0.24	0.46	18.8	20.1	
CVS 761	0.52	0.23	0.49	18.5	19.8	
CVS 762	0.58	0.23	0.37	19.4	20.1	DUAL DIAPHRAGM EGR
CVS 764	0.57	0.19	0.60	18.4	19.8	
CVS 765	0.55	0.26	0.70	22.8	19.9	
CVS 766	0.43	0.22	0.43	19.4	20.5	
CVS 767	0.68	0.20	0.40	18.8	20.1	
CVS 772	0.47	0.19	0.42	18.8	19.9	
CVS 773	0.22	0.17	0.39	17.7	--	

TABLE III-15

COMPARISON OF BASELINE & DUAL BED FTP/HIGHWAY TEST RESULTS - ETV 24 (BPEGR)

	EMISSIONS - G/KM -			FTP FUEL CONSUMPTION - L/100 KM -		HIGHWAY FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	WEIGHT	CARBON	WEIGHT
1975 BASELINE	0.96	0.30	1.24	18.1	--	14.5	13.9
	1.56	0.32	1.41	18.0	18.7	14.7	14.0
	1.22	0.24	1.45	18.7	19.0	14.2	13.7
AVERAGE	1.25	0.28	1.37	18.1	18.8	14.4	13.8
ZERO MILE (BPEGR)	0.48	0.21	0.49	19.6	20.3	13.8	14.3
	0.44	0.22	0.50	19.8	20.3	13.8	14.3
	0.55	0.25	0.53	19.8	20.1	14.2	14.5
AVERAGE	0.49	0.23	0.51	19.8	20.3	13.9	14.3
EPA ZERO MILE	0.57	0.16	0.55	19.3	--	13.8	--
	0.43	0.14	0.57	19.1	--	14.2	--
AVERAGE	0.50	0.15	0.56	19.2	--	14.0	--
+A/C	0.38	0.14	0.60	19.0	--	13.3	--

TABLE III-16

CONGESTED FREEWAY DRIVING SCHEDULE SULFATE TEST RESULTS

VEHICLE - ETV -	SULFATE RESULTS - MG/KM -				
	NO. OF TESTS	AVERAGE	S.D.	MAXIMUM	MINIMUM
24(1)	8	7.0	2.3	10.3	4.3
25	8	38.3	4.8	47.1	33.1

(1) 0.001 WT % sulfur fuel used for preconditioning
0.011 WT % sulfur fuel used for tests

REFERENCE: Somers, etal, "Automotive Sulfate Emissions -- A Baseline Study", SAE Paper No. 770166, February 28 - March 4, 1977, IAEC&E, Cobo Hall, Detroit

TABLE III-17

COMPARISON OF BASELINE & DUAL BED FTP/HIGHWAY TEST RESULTS - ETV 24 (DDEGR)

	EMISSIONS - G/KM -			FTP FUEL CONSUMPTION - L/100 KM -		HIGHWAY FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME	CARBON	VOLUME
1975 BASELINE	0.96	0.30	1.24	18.1	--	14.5	13.9
	1.56	0.32	1.41	18.0	18.7	14.7	14.0
	1.22	0.24	1.45	18.7	19.0	14.2	13.7
AVERAGE	1.25	0.28	1.37	18.1	18.8	14.4	13.8
ZERO MILE (DDEGR)	0.78	0.30	0.32	21.0	21.4	--	--
	0.58	0.29	0.30	20.6	21.0	--	--
	0.75	0.29	0.28	21.2	21.3	--	--
AVERAGE	0.70	0.29	0.30	20.9	21.2	--	--
ZERO MILE (BPEGR)	0.48	0.21	0.49	19.6	20.3	13.8	14.3
	0.44	0.22	0.50	19.8	20.3	13.8	14.3
	0.55	0.25	0.53	19.8	20.1	14.2	14.5
AVERAGE	0.49	0.23	0.51	19.8	20.3	13.9	14.3

TABLE III-18

COMPARISON OF BASELINE & DUAL BED FTP/HIGHWAY TEST RESULTS - ETV 25

	EMISSIONS - G/KM -			FTP FUEL CONSUMPTION - L/100 KM -		HIGHWAY FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME	CARBON	VOLUME
1975 BASELINE	1.45	0.84*	1.08	18.2	19.1	15.3	13.5
	1.32	0.22	1.11	18.1	18.1	13.6	13.1
	2.13	0.34	0.99	17.2	18.2	14.1	13.4
AVERAGE	1.63	0.28	1.05	17.8	18.5	14.3	13.3
ZERO MILE (DDEGR)	0.62	0.20	0.43	19.1	20.3	13.6	14.2
	1.14	0.24	0.42	18.8	20.5	13.8	14.7
	0.76	0.26	0.42	19.4	20.6	13.8	14.7
AVERAGE	0.84	0.24	0.43	19.1	20.5	13.8	14.5
EPA ZERO MILE	0.63	0.17	0.37	18.7	--	13.4	--
	0.43	0.17	0.35	18.4	--	13.4	--
AVERAGE	0.53	0.17	0.36	18.5	--	13.4	--
+A/C	0.44	0.18	0.36	19.0	--	13.9	--

*NOT INCLUDED IN AVERAGE

TABLE III-19

1975 FTP CALIBRATION TESTS - ETV 26

	EMISSIONS - G/KM -			FUEL CONSUMPTION - L/100 KM -	
TEST ID	CO	HC	NOx	CARBON	VOLUME
CVS 783	1.42	0.35	0.42	20.8	21.2
CVS 784	0.54	0.30	0.44	21.6	22.2
CVS 788	0.38	0.28	0.47	22.2	22.2
CVS 798	0.60	0.20	0.40	20.6	21.4
CVS 802	0.45	0.19	0.39	20.6	21.2
CVS 811	0.81	0.19	0.36	19.6	19.9
CVS 815	0.97	0.21	0.32	20.3	20.5

TABLE III-20

COMPARISON OF FEEDGAS & TAILPIPE EMISSIONS - ETV 24

	FTP EMISSIONS - G/KM -			FTP FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME
FEEDGAS	44.1	1.58	0.49	21.2	21.0
	45.8	1.68	0.53	21.2	20.8
	44.7	1.65	0.53	21.4	21.0
AVERAGE	44.8	1.64	0.52	21.2	21.0
TAILPIPE	0.66	0.20	0.30	20.6	21.4
	0.70	0.21	0.29	20.8	21.2
AVERAGE	0.68	0.21	0.30	20.6	21.2
REDUCTION	99%	87%	42%		

TABLE III-21

COMPARISON OF FEEDGAS & TAILPIPE EMISSIONS - ETV 25

	FTP EMISSIONS - G/KM -			FTP FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME
FEEDGAS	42.1	1.40	0.58	19.9	20.6
	34.8	1.34	0.70	19.8	20.6
	31.7	1.27	0.75	19.8	19.9
AVERAGE	36.2	1.34	0.68	19.8	20.3
TAILPIPE	0.62	0.20	0.43	19.1	20.3
	1.14	0.24	0.42	18.8	20.5
	0.76	0.26	0.42	19.4	20.6
AVERAGE	0.84	0.24	0.43	19.1	20.5
REDUCTION	98%	82%	37%		

TABLE III-22

COMPARISON OF FEEDGAS & TAILPIPE EMISSIONS - ETV 26

	FTP EMISSIONS - G/KM -			FTP FUEL CONSUMPTION - L/100 KM -	
	CO	HC	NOx	CARBON	VOLUME
FEEDGAS	28.8	1.38	0.55	19.3	19.9
	26.9	1.36	0.57	19.4	19.9
	28.5	1.35	0.56	19.4	20.5
AVERAGE	28.1	1.37	0.56	19.4	20.1
TAILPIPE	0.45	0.19	0.39	20.6	21.4
	0.81	0.19	0.36	19.6	19.9
	0.97	0.21	0.32	20.3	20.5
AVERAGE	0.74	0.20	0.36	20.2	20.5
REDUCTION	97%	85%	36%		

TABLE III-23

EFFECT OF VARIOUS HEAT CONSERVATION TECHNIQUES ON AVERAGE FTP INLET TEMPERATURES

	COLD STABILIZED INLET TEMPERATURE - °C -		HOT TRANSIENT INLET TEMPERATURE - °C -	
	DRIVER	PASSENGER	DRIVER	PASSENGER
WITHOUT EGR				
Stock Manifolds	409	462	488	528
Stock Manifolds & Port Liners	463	507	512	541
Insulated Manifolds	481*	529*	534*	573*
Insulated Manifolds & Port Liners	560*	588*	609*	631*
WITH EGR				
Stock Manifolds	456	502	524	553
Stock Manifolds & Port Liners	483*	533*	567*	614*
Insulated Manifolds	527*	572*	583*	618*
Insulated Manifolds & Port Liners	553*	585*	606*	626*

*Two Test Average

TABLE III-24

EFFECT OF VARIOUS HEAT CONSERVATION TECHNIQUES ON CATALYST CONVERSION EFFICIENCY

	COLD STABILIZED (BAG 2) - G/KM -			HOT TRANSIENT (BAG 3) - G/KM -		
	FEEDGAS	TAILPIPE	EFF	FEEDGAS	TAILPIPE	EFF
WITHOUT EGR						
Stock Manifolds (832/835)	1.08	0.57	47%	2.06	1.31	36%
Stock Manifolds & Port Liners (918/920)	1.07	0.76	28%	2.24	1.85	18%
Insulated Manifolds (855/838 & 845)	1.22	0.53*	57%	2.32	1.36*	41%
Insulated Manifolds & Port Liners (948/947 & 952)	1.12	0.48*	57%	2.42	0.71*	71%
WITH EGR						
Stock Manifolds (831/834)	0.31	0.21	34%	0.53	0.33	38%
Stock Manifolds & Port Liners (917/922 & 923)	0.47	0.26	45%	0.75	0.48	36%
Insulated Manifolds (856/839 & 846)	0.34	0.24*	29%	0.62	0.25*	60%
Insulated Manifolds & Port Liners (985/944 & 954)	0.46	0.24*	47%	0.75	0.33*	56%

*Two Test Average

(/) Denotes CVS Test ID (Feedgas/Tailpipe)

TABLE III-25

1975 FTP CALIBRATION TESTS - ETV 24 WITH PORT LINERS

TEST ID	EMISSIONS - G/KM - CO	HC	NOx	FUEL CONSUMPTION - L/100 KM - CARBON	VOLUME
CVS 975	1.61	0.39	0.37	20.7	21.1
CVS 976	1.18	0.42	0.30	21.0	21.8
CVS 977	1.65	0.35	0.25	22.9	22.5
CVS 978	1.02	0.27	0.24	22.1	22.8
CVS 979	1.00	0.31	0.24	22.1	22.5
CVS 980	1.72	0.37	0.21	22.3	22.8
CVS 981	1.35	0.29	0.28	22.1	22.4
CVS 982	1.31	0.37	0.26	21.3	22.4
CVS 983	0.64	0.32	0.32	20.5	21.1
CVS 984	0.78	0.37	0.33	20.8	21.2

TABLE III-26

EFFECT OF VARIOUS HEAT CONSERVATION TECHNIQUES ON FTP CONVERSION EFFICIENCY

	HYDROCARBON EMISSIONS - G/KM -			NOxEMISSIONS - G/KM -		
	FEEDGAS	TAILPIPE	EFF	FEEDGAS	TAILPIPE	EFF
			ORIGINAL HEADS & MANIFOLDS			
TEST ID (817, 820 & 822/799 & 801)						
BAG 1	1.57	0.39	75%	0.87	0.47	46%
BAG 2	1.78	0.14	92%	0.34	0.22	35%
BAG 3	1.42	0.19	87%	0.58	0.32	45%
COMPOSITE	1.64	0.21	88%	0.52	0.30	43%
			PORT LINERS & INSULATED MANIFOLDS			
TEST ID (985 & 986/981 & 982)						
BAG 1	2.09	0.74	65%	0.93	0.47	50%
BAG 2	2.31	0.19	92%	0.43	0.24	45%
BAG 3	1.79	0.25	86%	0.70		
COMPOSITE	2.14	0.34	84%	0.61	0.27	56%

(/) Denotes CVS Test ID (Feedgas/Tailpipe)

APPENDIX 1

GOULD URBAN DRIVING SCHEDULE

GOULD URBAN DRIVING SCHEDULE

Durability Driving Schedule

Distance: 44.1 miles Time: 1.7 hours

Average Speed: 26 mph

Base Station: Corner of Girdled Road and Painesville Ravenna Road (Old Rt. 44).

INSTRUCTIONS	POSITION	MILEAGE
Start of Route Stop Idle-15 sec. Accel to 40 mph	I90 and Vrooman Rd.	0
Decel to 20 mph Accel to 40 mph	Stop Ahead (sign)	.3
Stop Idle-15 sec Accel to 40 mph	Stop sign Vrooman Rd. and Carter	.5
Decel to 20 mph Accel to 40 mph	6351 Vrooman Rd.	.8
Decel to 20 mph Accel to 40 mph	Cemetery on right side	1 2
Stop Idle-15 sec Accel to stop sign	Stop sign Vrooman Rd. and Leroy Center	1.5
Stop Accel to 40 mph	Stop sign Vrooman Rd. and Rt. 86	1.5
Stop Idle-15 sec Accel to 40 mph	Leroy Chapel	1.9
Stop Idle-15 sec. Accel to 40 mph	Callow Rd.	2.1
Decel to 20 mph Accel to 40 mph	P. H. Mitrovich sign Rt. 86	2.3
Decel to 20 mph Accel to 40 mph	Curve Rt. 86	3.3
Stop Idle-15 sec. Accel to 30 mph	After turn on Brakeman	3.8

INSTRUCTIONS	POSITION	MILEAGE
Decel to 20 mph Accel to 30 mph	The Wills Family Red Fence	4. 1
Decel to 20 mph Accel to 30 mph	Wood on left Yellow house on right	4. 35
Decel to 20 mph Accel to 30 mph	High tension wires over raod	4. 8
Stop Idle-15 sec. Accel to 30 mph	Stop sign at turn into Radcliffe	5. 3
Stop Idle-15 sec. Accel to 45 mph (WOT)	Turn onto Brakeman 45 mph sign	5. 5
Decel to 20 mph Accel to 30 mph	Curve sign	6. 1
Decel to 20 mph Accel to 30 mph	Second curve	6. 3
Stop Idle-15 sec. Accel to 35 mph	Jct. 166 and Rt. 6	7. 9
Stop Idle-15 sec. Accel to 40 mph	Turn then stop onto 608	8. 1
Stop Idle-15 sec. Accel to 40 mph	Church on right	8. 3
Decel to 20 mph Accel to 40 mph	Hambden Auto wrecking	8. 9
Stop Idle-15 sec. Accel to 40 mph	Vyarwood Kennels	9. 2
Decel to 20 mph Accel to 40 mph	Curve	9. 4
Stop Idle-15 sec. Accel to 40 mph	ABC Ready Mix	10. 1
Decel to 20 mph Accel to 40 mph	Claridon-Troy Sisson Rd. (cross roads)	10. 5

INSTRUCTIONS	POSITION	MILEAGE
Decel to 20 mph Accel to 40 mph	Paradise Beach on left	10.9
Stop Idle-15 sec. Accel to 40 mph	Chardon Windsor Rd. Past intersection	11.4
Decel to 20 mph Accel to 40 mph	Bridge	11.7
Decel to 20 mph Accel to 40 mph	11796 Old State Rd. Armstrong Farm	12.2
Stop Idle-15 sec. Accel to 40 mph	White guard rail	12.5
Stop Idle-15 sec. Accel to 40 mph	Stop at Stillwell Rd.	12.9
Decel to 20 mph Accel to 40 mph	"Stop ahead" sign	13.3
Stop Idle-15 sec. Accel to 40 mph	Stop sign Rt. 322	13.6
Decel to 20 mph Accel to 40 mph	After drive-in mail box	13.7
Stop Idle-15 sec. Accel to 40 mph	White Bridge (white school bus stop bldg.)	14.2
Stop Idle-15 sec. Accel to 35 mph	Stop by Ensign Rd.	14.7
Decel to 20 mph Accel to 35 mph	Large blue silo	15.4
Decel to 20 mph Accel to 35 mph	RR crossing	15.7
Stop Idle-15 sec. Accel to 35 mph	Granview Restaurant	16.0
Stop Idle-15 sec. Accel to 35 mph	Cuyahoga River	16.2

INSTRUCTIONS	POSITION	MILEAGE
Decel to 20 mph Accel to 35 mph	Cramer mail box-13689	16.5
Stop Idle-15 sec. Accel to 35 mph	Turn onto Burton-Windsor Road	17.2
Stop Idle-15 sec. Accel to 35 mph	Sugar house on left	17.5
Decel to 20 mph Accel to 30 mph	Top of hill	17.8
Stop Idle-15 sec. Accel to 30 mph	RR crossing	18.1
Decel to 20 mph Accel to 30 mph	Narrow Bridge	18.4
Decel to 20 mph Accel to 30 mph	School sign	19.6
Stop Idle-15 sec. Accel to 30 mph	Welcome to Burton sign Turn left onto Peckham Rd.	19.9
	or	
	*Continue on Burton-Windsor Rd.	
Decel to 20 mph Accel to 30 mph	First house on left	20.0
Stop Idle-15 sec. Accel to 30 mph	Center St. Intersection Stop	20.3
Decel to 20 mph Accel to 30 mph	Top of hill	20.8
Stop Idle-15 sec. Accel to 25 mph	Stop sign Burton Square	20.9
Decel to 20 mph Accel to 30 mph	Turning onto Rt. 87	21.3
Stop Idle-15 sec. Accel to 35 mph	First drive past Ashland	21.5

* Dependent on Road Conditions

INSTRUCTIONS	POSITION	MILEAGE
Decel to 20 mph Accel to 35 mph	Highway dept. on left bottom of hill	22.0
Stop Idle-15 sec. Accel to 35 mph	Aquilla Road	22.7
Decel to 20 mph Accel to 35 mph	John Fink house signs both sides of road	23.2
Stop Idle-15 sec. Accel to 35 mph	Turn right on Rt. 44 (north)	23.6
Stop Idle-15 sec. Accel to 35 mph	Gray building on right Redling mailbox	24.3
Decel to 20 mph Accel to 35 mph	Twin Maples Used Furniture	24.7
Decel to 20 mph Accel to 35 mph	Butternut Road crossroad	25.0
Decel to 20 mph Accel to 35 mph	Geauga County Hospital	25.9
Stop Idle-15 sec. Accel to 35 mph	Orange driveway posts	26.4
Decel to 20 mph Accel to 35 mph	Signal ahead sign	27.1
Stop Idle-15 sec. Accel to 35 mph	Turn left Rt. 322	27.3
Stop Idle-15 sec. Accel to 35 mph	Teem sign on right	27.7
Stop Idle-15 sec. Accel to 45 mph	Kazsucks Service	27.9
Decel to 20 mph Accel to 45 mph	Texaco Station	28.3
Stop Idle-15 sec. Accel to 45 mph	Geauga Lake sign	28.9

INSTRUCTIONS	POSITION	MILEAGE
Decel to 20 mph Accel to 45 mph	Top of hill Gray Horse Farm	29.3
Stop Idle-15 sec. Accel to 45 mph	Turn right Auburn Rd.	29.5
Decel to 20 mph Accel to 45 mph	Second 45 mph sign	30.0
Stop Idle-15 sec. Accel to 45 mph	Sherman Road	30.6
Decel to 20 mph Accel to 45 mph	First 45 mph sign	30.8
Stop Idle-15 sec. Accel to 45 mph (WOT)	Wilson Mills Road	31.7
Decel to 20 mph Accel to 45 mph	First 45 mph sign	32.1
Stop Idle-15 sec. Accel to 35 mph	Thwing Road	32.8
Decel to 20 mph Accel to 35 mph	First 45 mph sign	33.0
Decel to 20 mph Accel to 35 mph	Second 45 mph sign	33.3
Stop Idle-15 sec. Accel to 35 mph	Chardon Road (Rt. 6)	33.5
Decel to 20 mph Accel to 35 mph	High tension wires	33.9
Decel to 20 mph Accel to 35 mph	45 mph sign	34.2
Decel to 20 mph Accel to 35 mph	Keep right sign	34.8
Stop Idle-15 sec. Accel to 35 mph	Mentor Road	35.1

INSTRUCTIONS	POSITION	MILEAGE
Decel to 20 mph	Red mailbox on left	35.3
Accel to 35 mph		
Decel to 20 mph	Turn right at Clark	35.6
Accel to 35 mph		
Stop Idle-15 sec.	Clark and Rt. 44	35.9
Accel to 55 mph (WOT)	Turn left onto Rt. 44	
Stop Idle-15 sec.	Entrance to I90	39.9
Accel to 55 mph (WOT)		
Decel to Idle	*I90 and Rt. 44	
Accel to 55 mph (WOT)	Rt. 86 overpass	
Decel end of run	Vrooman Exit	44.1

Repeat Run

* Dependent on Road Conditions

APPENDIX 2

EMISSIONS & FUEL CONSUMPTION TESTS - ETV 24

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                    ****** CVS 372 *  ***

                   *** IDENTIFICATION ***

TEST DATE: 6/25/75               ROAD TEST: NA
VEHICLE:  EIV 24                 DRIVER: LARRY
MATERIAL: GEX BASELINE           TEST MILES: 2790

COMMENTS:       BAD START-TROUBLE WITH ELECTRIC FUEL PUMP
                WEIGHTED FUEL 6.030-3.515  12.35MPG

                     *** TEST DATA ***

TEMP: 72  F (WET)                PRES: 751.135  MM HG (BARO)
      80  F (DRY)                       26.271  MM HG (VAPOR)
      100  F (MIX)                      26.075  IN. H2O (INLET)
RH:  68  %                              19.75  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2919
BLOWER RPM (ACT): 925.284        BLOWER RPM (CAL): 930.826

                   BAG 1            BAG 2            BAG 3
                AIR     EX       AIR     EX       AIR     EX

TIME (SECS)         499.65           866.6            511.4
BLOWER REVS          7730            13407             7818
CO  (PPM)       1.00  441.00    1.00     2.00    1.00     2.00
HC  (PPM C)    15.52  166.56   14.96    32.76   14.60    36.52
NOX (PPM)       1.09   75.17    1.61    26.59    1.07    77.42
CO2 (%)         0.03    2.20    0.03     1.59    0.04     2.23

                 *** CALCULATED RESULTS ***

               BAG 1            BAG 2            BAG 3

VMIX (CF)       1966.23          3410.25          1988.87
DF              5.93467          8.40934          5.99864

CORRECTED CONCENTRATIONS

NOX (PPM)        74.26            25.17            76.53
HC  (PPM C)     153.66            19.58            24.35
CO  (PPM)       411.62             1.03             1.06
CO2 (%)           2.18             1.56             2.20

MASS EMISSIONS  (GRAMS/BAG)

NOX               9.25             5.44             9.65
HC                4.93             1.09             0.79
CO               26.70             0.12             0.07
CO2            2230.28          2780.72          2278.37

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               1.99
HC                0.49
CO                1.55
CO2             671.79

FUEL ECONOMY  (MILES/GAL)

FEMPG            13.40
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                    ****** CVS [illegible] ** ***

                    *** IDENTIFICATION ***

TEST DATE: 6/26/75                    ROAD TEST: NA
VEHICLE:  EIV 24                      DRIVER: LARRY
MATERIAL: GEN II CAT                  TEST MILES: 2813

COMMENTS:          2ND BASELINE CVS
                   WEIGHTED FUEL 6.100-3.625  13.55MPG

                       *** TEST DATA ***

TEMP: 73   F (WET)                    PRES: 749.135  MM HG (BARO)
      80   F (DRY)                          26.271  MM HG (VAPOR)
      100   F (MIX)                         26.075  IN. H2O (INLET)
RH:  72  %                                  19.775  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS                 BLOWER SPEED:  3
FUEL: HO III                          CF/REV: .2919
BLOWER RPM (ACT): 928.134             BLOWER RPM (CAL): 930.404

                    BAG 1              BAG 2              BAG 3
                  AIR     EX        AIR     EX         AIR     EX

TIME (SECS)          505               866.65             507.35
BLOWER REVS          7821              13433              7843
CO  (PPM)        1.00   710.00    1.00     2.00     1.00     2.00
HC  (PPM C)     21.08   202.40   17.72    31.72    17.60    38.36
NOX (PPM)        1.04    83.60    1.34    29.17     1.17    82.58
CO2 (%)          0.03     2.34    0.04     1.58     0.03     2.23

                    *** CALCULATED RESULTS ***

                 BAG 1              BAG 2             BAG 3

VMIX (CF)       1983.84            3407.35           1989.49
DF              5.52261            8.46301           5.99815

CORRECTED CONCENTRATIONS

NOX (PPM)         82.75              27.99             81.61
HC  (PPM C)      185.14              16.09             23.69
CO  (PPM)        660.71               1.03              1.05
CO2 (%)            2.32               1.54              2.21

MASS EMISSIONS  (GRAMS/BAG)

NOX               10.80               6.27             10.68
HC                 6.00               0.90              0.77
CO                43.21               0.12              0.07
CO2             2395.48            2744.88           2287.65

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                2.27
HC                 0.52
CO                 2.50
CO2              677.19

FUEL ECONOMY  (MILES/GAL)

FEMPG             13.10
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                     *** IDENTIFICATION ***

TEST DATE: 7/1/75                  ROAD TEST: NA
VEHICLE:  EIV 24                   DRIVER: MIKE K
MATERIAL: GEM BASELINE             TEST MILES: 2858VM

COMMENTS:        FACTORY SPECS  3RD BASELINE CVS
                 WEIGHTED FUEL 6220-3715  12.4MPG

                       *** TEST DATA ***

TEMP: 74  F (WET)                  PRES: 751.995  MM HG (BARO)
      82  F (DRY)                        28.021  MM HG (VAPOR)
      100  F (MIX)                       25.9  IN. H2O (INLET)
RH:  69  %                               19.8625  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2920
BLOWER RPM (ACT): 928.401          BLOWER RPM (CAL): 930.793

                      BAG 1            BAG 2            BAG 3
                   AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          506.8            867.85           505.55
BLOWER REVS          7842             13428            7823
CO  (PPM)          12.00  535.00   13.00   18.00   13.00   20.00
HC  (PPM C)        18.96  131.20   14.32   27.00   14.24   35.12
NOX (PPM)          0.87    92.60   1.80    29.14   1.48    80.00
CO2 (%)            0.05     2.60   0.07     1.60   0.07     2.32

                   *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)         1999.11          3423.12          1994.27
DF                5.03239          8.35201          5.7625

CORRECTED CONCENTRATIONS

NOX (PPM)          91.90            27.56            78.78
HC  (PPM C)       116.01            14.39            23.35
CO  (PPM)         486.90             5.86             8.16
CO2 (%)             2.56             1.54             2.26

MASS EMISSIONS  (GRAMS/BAG)

NOX                12.24             6.28            10.46
HC                  3.79             0.80             0.76
CO                 32.09             0.66             0.54
CO2              2668.83          2746.25          2352.66

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 2.33
HC                  0.38
CO                  1.97
CO2               697.98

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.57
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                      ****** CVS 604 * ****

                      *** IDENTIFICATION ***

   TEST DATE: 8/6/75                    ROAD TEST: NA
   VEHICLE:  FTV 24                     DRIVER: LARRY
   MATERIAL: GEM DUMMIES                TEST MILES: 0

   COMMENTS:          5.980-3.580=2400=12.95
                      FIRST CVS WITH CATALYSTS  GOOD RUN

                         *** TEST DATA ***

   TEMP: 68   F (WET)                   PRES: 745.085  MM HG (BARO)
         75   F (DRY)                          22.243  MM HG (VAPOR)
         96   F (MIX)                          25.1125  IN. H2O (INLET)
   RH:  70  %                                  19.1625  IN. H2O (OUTLET)
   INERTIA WT.: 4000 LBS                BLOWER SPEED:  3
   FUEL: HO III                         CF/REV: .3008
   BLOWER RPM (ACT): 928.479            BLOWER RPM (CAL): 928.534

                    BAG 1              BAG 2              BAG 3
                  AIR     EX         AIR     EX         AIR     EX

   TIME (SECS)      504.2              867.4              505.6
   BLOWER REVS      7801               13422              7826
   CO  (PPM)      1.00    25.00      1.00     2.00      1.00     2.00
   HC  (PPM C)    9.44    50.00      8.76    22.60      9.24    29.72
   NOX (PPM)      0.82    41.00      1.32    19.40      1.14    47.00
   CO2 (%)        0.04     2.05      0.03     1.29      0.03     1.88

                    *** CALCULATED RESULTS ***

                  BAG 1              BAG 2              BAG 3

   VMIX (CF)      2047.3             3522.49            2053.86
   DF             6.51325            10.3679            7.1157

   CORRECTED CONCENTRATIONS

   NOX (PPM)      40.31              18.21              46.02
   HC  (PPM C)    42.01              14.68              21.78
   CO  (PPM)      22.62               1.02               1.04
   CO2 (%)         2.02               1.26               1.85

   MASS EMISSIONS  (GRAMS/BAG)

   NOX             4.88               3.79               5.59
   HC              1.40               0.84               0.73
   CO              1.53               0.12               0.07
   CO2          2152.57            2319.91            1986.03

   WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

   NOX             1.21
   HC              0.25
   CO              0.11
   CO2           583.67

   FUEL ECONOMY  (MILES/GAL)

   EPAMPG         15.22
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                    [illegible]

              *** IDENTIFICATION ***

TEST DATE: 8-9-75              ROAD TEST: 9A
VEHICLE:  FIV 24               DRIVER: MIKE P
MATERIAL: GEM 68 OB/OF         TEST MILES: ZERO

COMMENTS:        FIRST TEST OF THESE CATALYST
                 54.8/48.9 85.9/70.2 CONV. BEFORE TEST CVS

                  *** TEST DATA ***

TEMP: 66  F (WET)              PRES: 750.985  MM HG (BARO)
      78  F (DRY)                     24.617  MM HG (VAPOR)
      93  F (MIX)                     25.375  IN. H2O (INLET)
RH:  56  %                            19.425  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3010
BLOWER RPM (ACT): 928.239      BLOWER RPM (CAL): 928.481

                     BAG 1           BAG 2            BAG 3
                  AIR     EX      AIR     EX       AIR      EX

TIME (SECS)          503            867.6            502.4
BLOWER REVS          7781           13439            7772
CO  (PPM)         1.00  339.00    1.00     2.00    1.00     2.00
HC  (PPM C)       7.24   57.24    5.80    20.84    7.36    31.08
NOX (PPM)         0.49   69.96    0.70    25.51    0.57    64.26
CO2 (%)           0.04    2.50    0.06     1.41    0.06     2.00

               *** CALCULATED RESULTS ***

                  BAG 1           BAG 2           BAG 3

VMIX (CF)         2070.63         3576.29         2068.23
DF                5.28104         9.48824         6.68897

CORRECTED CONCENTRATIONS

NOX (PPM)         69.56           24.88           63.78
HC  (PPM C)       51.37           15.65           24.89
CO  (PPM)         315.76          1.03            1.05
CO2 (%)           2.47            1.36            1.95

MASS EMISSIONS  (GRAMS/BAG)

NOX                8.04           4.97            7.36
HC                 1.74           0.91            0.84
CO                21.56           0.12            0.07
CO2             2664.56        2529.59         2102.12

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                1.68
HC                 0.29
CO                 1.26
CO2              649.31

FUEL ECONOMY  (MILES/GAL)

EPAMPG            13.49
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                    ****** CVS FTP ******

                    *** IDENTIFICATION ***

TEST DATE: 9-8-75                 ROAD TEST: NO
VEHICLE:   STV 24                 DRIVER: LARRY
MATERIAL: GEM 68-OD/OE            TEST MILES: 400

COMMENTS:        2 MIN. PORT AIR BAG 1 2.5 MIN NO VAC. ADV.THEN PORT
                 BAG 3 45 SEC. PORTED AIR 2.5 MIN NO VAC ADV THEN PO

                      *** TEST DATA ***

TEMP: 62  F (WET)                 PRES: 747.935  MM HG (BARO)
      77  F (DRY)                         23.755  MM HG (VAPOR)
      92  F (MIX)                         25.725  IN. H2O (INLET)
RH:   42  %                               19.6  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3020
BLOWER RPM (ACT): 928.447         BLOWER RPM (CAL): 928.428

                    BAG 1             BAG 2             BAG 3
                 AIR     EX        AIR     EX        AIR     EX

TIME (SECS)        488               866.0             504.85
BLOWER REVS        7540              13415             7214
CO  (PPM)       23.00   358.00    28.00    33.00    24.00    29.00
HC  (PPM C)      6.32   118.00     6.76    20.68     6.64    26.88
NOX (PPM)        0.48    24.90     0.44     6.41     0.53    16.86
CO2 (%)          0.04     3.12     0.04     1.69     0.04     2.36

                  *** CALCULATED RESULTS ***

                 BAG 1              BAG 2              BAG 3

VMIX (CF)        2008.18            3568.65            2078.63
DF               4.23386            7.9046             5.66497

CORRECTED CONCENTRATIONS

NOX (PPM)          24.53              6.03              16.42
HC  (PPM C)       113.17             14.78              21.37
CO  (PPM)         314.31              7.35               7.74
CO2 (%)             3.09              1.66               2.33

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.48              1.07               1.74
HC                  3.71              0.36               0.73
CO                 20.81              0.87               0.53
CO2              3235.42           3080.16            2522.61

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.42
HC                  0.38
CO                  1.35
CO2               787.91

FUEL ECONOMY  (MILES/GAL)

FEAMPG             11.08
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                    *** IDENTIFICATION ***

TEST DATE: 9-9-75                  ROAD TEST: NA
VEHICLE:  EIV 2/4                  DRIVER: LARRY
MATERIAL: GEN 68-0:/05             TEST MILES: 425

COMMENTS:        ISTALLON COLD START
                 3788 CC 1887.2 SEC 23 DEGREE C

                      *** TEST DATA ***

TEMP: 56  F (WET)                  PRES: 755.935  MM HG (BARO)
      70  F (DRY)                         18.765  MM HG (VAPOR)
      98  F (MIX)                         25.9  IN. H2O (INLET)
RH:  40  %                               -20.3  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3025
BLOWER RPM (ACT): 928.49           BLOWER RPM (CAL): 928.34

                    BAG 1              BAG 2              BAG 3
                 AIR     EX         AIR     EX         AIR     EX

TIME (SECS)         515               352.15             1019.25
BLOWER REVS         7969              13420               7812
CO  (PPM)        8.00   368.00     8.00    14.00    12.00    24.00
HC  (PPM C)      4.56   150.80     4.76    19.20     4.28    24.40
NOX (PPM)        0.37    30.90     0.48     8.19     0.38    24.10
CO2 (%)          0.04     2.92     0.04     1.62     0.04     2.26

                   *** CALCULATED RESULTS ***

                 BAG 1             BAG 2             BAG 3

VMIX (CF)        2123.38           3575.83           2081.55
DF               4.51279           8.255             5.91683

CORRECTED CONCENTRATIONS

NOX (PPM)          30.61              7.77             23.78
HC  (PPM C)       147.25             15.02             20.84
CO  (PPM)         336.41              6.44             12.80
CO2 (%)             2.89              1.58              2.23

MASS EMISSIONS  (GRAMS/BAG)

NOX                 3.07              1.31              2.34
HC                  5.11              0.88              0.71
CO                 23.55              0.76              0.88
CO2              3193.96           2955.41           2417.21

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.53
HC                  0.46
CO                  1.52
CO2               761.17

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.41
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11.1 weight

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                     ****** CVS 620 * ****

                    *** IDENTIFICATION ***

TEST DATE: 9-10-75                 ROAD TEST: 90
VEHICLE:  EIV 24                   DRIVER: LOPEZ
VAT-KIBL: GSM 68-J0Z3E             TEST MILES: 450

COMMENTS:         3944 CC 1878.3 SEC 22 DEGREE C
                  GM EXP. EGR - 1220

                       *** TEST DATA ***

TEMP: 57  F (WET)                  PRES: 755.685  MM HG (OBS)
      75  F (DRY)                         22.243  MM HG (VAPOR)
      98  F (MIX)                         25.9  IN. H2O (INLET)
RH:  30  %                                19.425  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3014
.BLOWER RPM (ACT): 928.431         BLOWER RPM (CAL): 928.428

                      BAG 1              BAG 2              BAG 3
                   AIR      EX       AIR      EX        AIR      EX

TIME (SECS)           505.2             867.9              505.1
BLOWER REVS           7817              13430              7816
CO  (PPM)        16.00 2750.00   13.00     21.00   16.00     29.00
HC  (PPM C)       5.32  554.00    5.20     19.12    5.52     30.48
NOX (PPM)         0.35   22.00    0.36     13.75    0.47     25.70
CO2 (%)           0.04    2.48    0.04      1.64    0.04      2.27

                   *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)        2074.43          3564.83          2074.66
DF               4.79495          8.15122          5.88906

CORRECTED CONCENTRATIONS

NOX (PPM)          21.72            13.43            25.31
HC  (PPM C)       549.79            14.56            25.90
CO  (PPM)        2579.53             8.34            14.30
CO2 (%)             2.45             1.60             2.24

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.09             2.22             2.43
HC                 18.63             0.85             0.88
CO                176.47             1.04             0.98
CO2              2649.29          2983.62          2420.07

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.60
HC                  1.25
CO                 10.33
CO2               733.63

FUEL ECONOMY  (MILES/GAL)

FEMPG              11.73
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FRONT	REAR	INDEX
.165	.130	

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                    ****** CVS 623 * ****

                  *** IDENTIFICATION ***

TEST DATE: 9-11-75                ROAD TEST: NA
VEHICLE:  EIV 24                  DRIVER: [illegible]
MATERIAL: GE4 68-0D/0F            TEST MILES: 500

COMMENTS:        3788 CC 1878.1 SEC. 32 DEGREE C  POST-O VAC. 9 413.
                 30 SEC. 4.1 2.5 MIN. 41 VAC. AT START OF [illegible] 1 [illegible]

                     *** TEST DATA ***

TEMP: 70  F (WET)                 PRES: 742.585  MM HG (BARO)
      84  F (DRY)                             30.87  MM HG (VAPOR)
      99  F (MIX)                             25.2  IN. H2O (INLET)
RH:  49  %                                    19.425  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3015
BLOWER RPM (ACT): 928.559         BLOWER RPM (CAL): 928.499

                    BAG 1             BAG 2             BAG 3
                  AIR     EX        AIR     EX        AIR     EX

TIME (SECS)          505.8             867.4             505.6
BLOWER REVS          7821              13424             7822
CO  (PPM)       10.00   207.00   12.00    19.00   13.00    28.00
HC  (PPM C)      7.08   118.40    7.20    21.64    7.24    31.04
NOX (PPM)        0.58    32.00    0.70    15.30    0.75    18.70
CO2 (%)          0.04     2.95    0.04     1.75    0.04     2.40

                 *** CALCULATED RESULTS ***

                  BAG 1             BAG 2             BAG 3

VMIX (CF)        2038.13           3408.25           2038.37
DF               4.49532           7.63981           5.57009

CORRECTED CONCENTRATIONS

NOX (PPM)          31.55             14.69             18.08
HC  (PPM C)       111.29             15.38             25.14
CO  (PPM)         184.52              7.40             15.77
CO2 (%)             2.42              1.72              2.37

MASS EMISSIONS  (GRAMS/BAG)

NOX                 3.70              2.96              2.12
HC                  3.70              0.88              0.84
CO                 12.39              0.90              1.06
CO2              3102.45           3129.17           2516.36

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.77
HC                  0.39
CO                  0.91
CO2               786.34

FUEL ECONOMY  (MILES/GAL)

FDS/FG             11.21
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                    ****** CVS 636 ******

                    *** IDENTIFICATION ***

TEST DATE: 9-23-75              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: MIKE E
MATERIAL:  GEM NONE             TEST MILES: 3139

COMMENTS:        12 BTDC  .326 ORFICE   PORTED VAC. WITH SPARK DELAY VALVE
                 GOOD START - HIGH IDLE SPEED TOO LOW  27 DEGREE C

                       *** TEST DATA ***

TEMP: 61   F (WET)              PRES: 748.285  MM HG (BARO)
      76   F (DRY)                    22.922  MM HG (VAPOR)
      95   F (MIX)                    25.55  IN. H20 (INLET)
RH:  41  %                            19.6   IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3017
BLOWER RPM (ACT): 928.351       BLOWER RPM (CAL): 928.446

                     BAG 1             BAG 2             BAG 3
                   AIR    EX         AIR    EX         AIR    EX

TIME (SECS)          504.3             867.2             511
BLOWER REVS          7802              13419             7906
CO  (PPM)        15.50 1954.00     23.20 1600.00     17.50 1803.00
HC  (PPM C)       8.96  340.84      9.60  204.68      9.32  249.96
NOX (PPM)         0.65   69.43      1.01   31.85      0.87   75.13
CO2 (%)           0.04    2.36      0.04    1.43      0.05    1.95

                    *** CALCULATED RESULTS ***

                  BAG 1              BAG 2              BAG 3

VMIX (CF)         2064.42            3550.69            2091.94
DF                5.19779            8.3544             6.24377

CORRECTED CONCENTRATIONS

NOX (PPM)           68.91              30.96              74.40
HC  (PPM C)        333.60             196.23             242.13
CO  (PPM)         1827.00            1514.61            1696.94
CO2 (%)              2.33               1.39               1.91

MASS EMISSIONS  (GRAMS/BAG)

NOX                  7.05               5.45               7.72
HC                  11.25              11.38               8.27
CO                 124.35             177.31             117.04
CO2               2505.99            2562.70            2081.53

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  1.72
HC                   2.79
CO                  39.67
CO2                646.23

FUEL ECONOMY  (MILES/GAL)

EPAMPG              12.43
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                    ****** CVS 637 ******

                    *** IDENTIFICATION ***

TEST DATE: 9-25-75                ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: LARRY
MATERIAL: GEM NONE                TEST MILES: 3178

COMMENTS:       .408 ORIFICE 12 BTDC
                PORTED VAC.  29 DEGREE C

                      *** TEST DATA ***

TEMP: 63  F (WET)                 PRES: 746.935  MM HG (BARO)
      79  F (DRY)                       25.509  MM HG (VAPOR)
      98  F (MIX)                       25.725  IN. H20 (INLET)
RH:  40  %                              19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3021
BLOWER RPM (ACT): 928.408         BLOWER RPM (CAL): 928.428

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          504.4            869.4            504.9
BLOWER REVS          7606             13451            7813
CO  (PPM)       43.00 2347.00   65.00 1572.00   39.00 1712.00
HC  (PPM C)      7.24  422.00    9.56  200.80   10.16  267.20
NOX (PPM)        0.74   45.00    0.83   26.10    1.48   53.60
CO2 (%)          0.04    2.34    0.04    1.47    0.04    1.98

                  *** CALCULATED RESULTS ***

 )               BAG 1            BAG 2            BAG 3

VMIX (CF)       2051.82          3535.62          2053.66
DF              5.14732          8.16674          6.17744

CORRECTED CONCENTRATIONS

NOX (PPM)         44.40            25.37            52.36
HC  (PPM C)      416.17           192.41           258.68
CO  (PPM)       2176.76          1450.90          1592.36
CO2 (%)            2.31             1.43             1.95

MASS EMISSIONS  (GRAMS/BAG)

NOX                4.61             4.54             5.45
HC                13.94            11.11             8.68
CO               147.25           169.13           107.82
CO2             2469.37          2645.70          2084.65

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                1.28
HC                 2.94
CO                39.19
CO2              652.77

FUEL ECONOMY  (MILES/GAL)

EPAMPG            12.35
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                    ****** CVS 638 ******

                   *** IDENTIFICATION ***

TEST DATE: 9-26-75                  ROAD TEST: NA
VEHICLE:  ETV 24                    DRIVER: LARRY
MATERIAL: GEM NONE                  TEST MILES: 3216

COMMENTS:          .422 ORIFICE 12 BTDC
                   PORTED VAC.  27 DEGREE C

                      *** TEST DATA ***

TEMP: 64  F (WET)                   PRES: 747.135  MM HG (BARO)
      79  F (DRY)                         25.509  MM HG (VAPOR)
      98  F (MIX)                         25.55  IN. H20 (INLET)
RH:  43  %                                19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3018
BLOWER RPM (ACT): 928.352           BLOWER RPM (CAL): 928.446

                     BAG 1           BAG 2           BAG 3
                   AIR    EX       AIR    EX       AIR    EX

TIME (SECS)         506.2           868.3           504.7
BLOWER REVS         7834            13434           7808
CO  (PPM)        12.00 1868.00   31.00 1639.00   21.00 1771.00
HC  (PPM C)       7.92  375.60   11.68  207.20    9.48  260.80
NOX (PPM)         0.33   44.20    1.00   20.40    0.80   42.70
CO2 (%)           0.04    2.56    0.04    1.44    0.04    2.00

                  *** CALCULATED RESULTS ***

                 BAG 1           BAG 2           BAG 3

VMIX (CF)        2058.98         3530.8          2052.14
DF               4.83308         8.28285         6.10784

CORRECTED CONCENTRATIONS

NOX (PPM)          43.54           19.52           42.03
HC  (PPM C)       369.32          196.93          252.87
CO  (PPM)        1740.62         1543.92         1660.90
CO2 (%)             2.53            1.40            1.97

MASS EMISSIONS  (GRAMS/BAG)

NOX                 4.63            3.56            4.46
HC                 12.42           11.35            8.47
CO                118.16          179.73          112.38
CO2              2714.75         2586.73         2104.59

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.08
HC                  2.37
CO                 39.28
CO2               660.49

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.08
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                     ****** CVS 640 ******

                     *** IDENTIFICATION ***

TEST DATE: 9-26-75             ROAD TEST: NA
VEHICLE:  ETV 24               DRIVER: LARRY
MATERIAL: GEM 68-OD/OE         TEST MILES: 100

COMMENTS:        .406 ORIFICE PORTED VAC. 12 BTDC
                 IMTER. SPRING HOT START 28 DEGREE C

                       *** TEST DATA ***

TEMP: 64  F (WET)              PRES: 747.635  MM HG (BARO)
      80  F (DRY)                    26.271  MM HG (VAPOR)
      98  F (MIX)                    25.55  IN. H20 (INLET)
RH:  41  %                           19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3016
BLOWER RPM (ACT): 928.666      BLOWER RPM (CAL): 928.464

                      BAG 1          BAG 2          BAG 3
                   AIR    EX      AIR    EX      AIR    EX

TIME (SECS)          504.9          868.9          504.7
BLOWER REVS          7813           13446          7816
CO  (PPM)        26.00  253.00  19.00   26.00  12.00   42.00
HC  (PPM C)       7.36   76.80   7.24   29.48   7.04   55.20
NOX (PPM)         0.80   24.90   0.72    7.97   0.62   19.30
CO2 (%)           0.04    2.48   0.04    1.64   0.04    2.24

                  *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)        2053.18        3533.48        2053.97
DF               5.33517        8.14376        5.95692

CORRECTED CONCENTRATIONS

NOX (PPM)          24.25           7.34          18.78
HC  (PPM C)        72.82          23.13          49.34
CO  (PPM)         216.72           8.39          29.78
CO2 (%)             2.45           1.60           2.21

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.56           1.33           1.98
HC                  2.44           1.33           1.65
CO                 14.67           0.98           2.02
CO2              2620.62        8957.39        2363.71

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.48
HC                  0.44
CO                  1.12
CO2               724.21

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.33
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                    ****** CVS 641 ******

                    *** IDENTIFICATION ***

TEST DATE: 9-29-75             ROAD TEST: NA
VEHICLE:  ETV 24               DRIVER: LARRY
MATERIAL: GEM 68 OD/OE         TEST MILES: 115

COMMENTS:     VEHICLE NOT RUN FOR 2 FULL DAYS.  NO VAC. ADV. FIRST 2 MI
N OF
              FIRST BAG. TOO MUSCH CHOKE BAG ONE 3802CC 11.1MPG

                      *** TEST DATA ***

TEMP: 61   F (WET)             PRES: 751.385  MM HG (BARO)
      79   F (DRY)                    25.509  MM HG (VAPOR)
      90   F (MIX)                    25.725  IN. H20 (INLET)
RH:  34  %                            19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3017
BLOWER RPM (ACT): 928.517      BLOWER RPM (CAL): 928.428

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)         504.3            867.3            504.1
BLOWER REVS         7804             13423            7800
CO  (PPM)       20.70 1620.00    20.60    25.00   15.90    27.20
HC  (PPM C)      7.16  134.32     7.32    26.92    7.68    36.24
NOX (PPM)        0.23   15.38     0.34     8.03    0.25    27.16
CO2 (%)          0.04    2.76     0.04     1.65    0.04     2.20

                   *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)        2091.96          3598.2           2090.88
DF               4.58112          8.09626          6.07379

CORRECTED CONCENTRATIONS

NOX (PPM)          15.20             7.73             26.95
HC  (PPM C)       128.72            20.50             29.82
CO  (PPM)        1500.13             6.07             12.61
CO2 (%)             2.73             1.61              2.17

MASS EMISSIONS  (GRAMS/BAG)

NOX                 1.55             1.35              2.74
HC                  4.40             1.20              1.02
CO                103.47             0.72              0.87
CO2              2976.92          3030.37           2362.44

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.48
HC                  0.49
CO                  6.09
CO2               754.27

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.51
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                    ****** CVS 643 ******

                   *** IDENTIFICATION ***

TEST DATE: 10-1-75                 ROAD TEST: MA
VEHICLE:  ETV 24                   DRIVER: LARRY
MATERIAL: GEM 68-0D/0E             TEST MILES: 175

COMMENTS:        .422 ORIFICE .225 DEPTH 12 BTEDC
                 PORTED VAC. 27 DEGREE C

                     *** TEST DATA ***

TEMP: 62  F (WET)                  PRES: 745.585  MM HG (BARO)
      75  F (DRY)                        22.243  MM HG (VAPOR)
      98  F (MIX)                        25.725  IN. H2O (INLET)
RH:  47  %                               19.6  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3022
BLOWER RPM (ACT): 928.333          BLOWER RPM (CAL): 928.428

                     BAG 1            BAG 2            BAG 3
                   AIR    EX        AIR    EX        AIR    EX

TIME (SECS)          504.6            868.5            504.2
BLOWER REVS          7809             13435            7802
CO  (PPM)         10.00   71.00    10.00   18.00    9.60   34.00
HC  (PPM C)        6.36   94.40     6.72   28.56    6.16   44.00
NOX (PPM)          0.47   17.70     0.68    5.64    0.55   15.30
CO2 (%)            0.04    2.69     0.04    1.65    0.04    2.32

                  *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)        2049.37          3525.84          2047.53
DF               4.95184          8.09877          5.75701

CORRECTED CONCENTRATIONS

NOX (PPM)          17.32            5.04            14.85
HC  (PPM C)        89.32           22.67            38.91
CO  (PPM)          58.39            8.52            24.15
CO2 (%)             2.66            1.61             2.29

MASS EMISSIONS  (GRAMS/BAG)

NOX                 1.81            0.91             1.55
HC                  2.99            1.31             1.30
CO                  3.95            0.99             1.63
CO2              2840.81         2969.43          2441.98

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.34
HC                  0.44
CO                  0.48
CO2               744.39

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.90
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                    ****** CVS 646 ******

                   *** IDENTIFICATION ***

TEST DATE: 10-2-75              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: MIKE E
MATERIAL:  GEM 68-OD/OE         TEST MILES: 190

COMMENTS:       .422 ORIFICE .175 DEPHT 12 BTDC PORTED VAC.
                FRONT VAC. BREAK CLOSED .014

                     *** TEST DATA ***

TEMP: 59   F (WET)              PRES: 751.235  MM HG (BARO)
      77   F (DRY)                     23.758  MM HG (VAPOR)
      98   F (MIX)                     25.375  IN. H20 (INLET)
RH:   32  %                            19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3010
BLOWER RPM (ACT): 928.53        BLOWER RPM (CAL): 928.481

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          504.4            863.9            510.8
BLOWER REVS          7806             13369            7905
CO   (PPM)        8.90  163.00    11.00   17.00    13.00   27.00
HC   (PPM C)      7.08   98.00     7.40   29.08     6.84   38.72
NOX  (PPM)        0.78   23.00     0.83    5.80     0.63   18.30
CO2  (%)          0.04    2.76     0.04    1.76     0.04    2.30

                 *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)        2059.26          3526.81          2085.38
DF               4.81138          7.59408          5.80986

CORRECTED CONCENTRATIONS

NOX  (PPM)         22.38             5.08            17.78
HC   (PPM C)       92.39            22.65            33.06
CO   (PPM)        145.68             6.80            14.87
CO2  (%)            2.73             1.73             2.27

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.18             0.85             1.76
HC                  3.11             1.30             1.13
CO                  9.89             0.79             1.02
CO2              2929.95          3173.17          2465.30

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.37
HC                  0.44
CO                  0.75
CO2               778.44

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.45
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                    ****** CVS 649 ******

                   *** IDENTIFICATION ***

TEST DATE: 10-3-75            ROAD TEST: NA
VEHICLE:  ETV 04              DRIVER: LARRY
MATERIAL: GEM 68-0D/0E        TEST MILES: 205

COMMENTS:        .422 ORIFICE .175 DEPTH REAR VAC. BRK. .182 12 BTDC
                 PORTED VAC. ADV. EFE VALVE IS ON 3 MIN. 15 SEC. AT START
OF TEST

                      *** TEST DATA ***

TEMP: 47   F (WET)             PRES: 756.935  MM HG (BARO)
      78   F (DRY)                    24.617  MM HG (VAPOR)
      99   F (MIX)                    25.2  IN. H20 (INLET)
RH:  24  %                            19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3003
BLOWER RPM (ACT): 928.612      BLOWER RPM (CAL): 928.499

                      BAG 1          BAG 2          BAG 3
                    AIR    EX      AIR    EX      AIR    EX

TIME (SECS)           505.4          867.6          504.9
BLOWER REVS           7823           13427          7814
CO  (PPM)          8.40  310.00  10.00   18.00   9.00   23.00
HC  (PPM C)        6.76   76.00   7.04   26.76   6.84   36.36
NOX (PPM)          0.68   28.10   0.63    8.51   0.48   20.40
CO2 (%)            0.05    2.70   0.05    1.70   0.05    2.28

                   *** CALCULATED RESULTS ***

                  BAG 1          BAG 2          BAG 3

VMIX (CF)        2072.97        3557.95        2070.59
DF               4.89632        7.86199        5.86224

CORRECTED CONCENTRATIONS

NOX (PPM)          27.56           7.96          20.00
HC  (PPM C)        70.52          20.62          30.69
CO  (PPM)         284.85           8.61          14.41
CO2 (%)             2.66           1.66           2.24

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.60           1.29           1.88
HC                  2.39           1.20           1.04
CO                 19.47           1.01           0.98
CO2              2875.84        3073.32        2417.19

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.46
HC                  0.38
CO                  1.33
CO2               758.36

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.71
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                    ****** CVS 650 ******

                   *** IDENTIFICATION ***

TEST DATE: 10-4-75                 ROAD TEST: NA
VEHICLE:  ETV 24                   DRIVER: LARRY
MATERIAL: GEM 68-OD/OE             TEST MILES: 220

COMMENTS:          NO EFE VALVE
                    .422 ORIFICE 12 BTDC

                      *** TEST DATA ***

TEMP: 58   F (WET)                 PRES: 754.635  MM HG (BARO)
      78   F (DRY)                       24.617  MM HG (VAPOR)
      98   F (MIX)                       25.375  IN. H20 (INLET)
RH:  27  %                               19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3010
BLOWER RPM (ACT): 928.292          BLOWER RPM (CAL): 928.464

                    BAG 1          BAG 2          BAG 3
                  AIR    EX      AIR    EX      AIR    EX

TIME (SECS)         506.3          868.5          520.1
BLOWER REVS         7834           13436          8047
CO  (PPM)        11.00  97.00   14.00  21.00   12.00  49.00
HC  (PPM C)       8.84  74.40    9.84  32.04    9.48  46.80
NOX (PPM)         0.41  26.50    0.64   5.59    0.52  17.30
CO2 (%)           0.04   2.68    0.05   1.68    0.04   2.28

                  *** CALCULATED RESULTS ***

                  BAG 1          BAG 2          BAG 3

VMIX (CF)        2076.3         3561.04        2132.75
DF               4.9693         7.95149        5.85326

CORRECTED CONCENTRATIONS

NOX (PPM)         26.17            5.03          16.87
HC  (PPM C)       67.34           23.44          38.94
CO  (PPM)         82.44            8.01          36.56
CO2 (%)            2.65            1.64           2.25

MASS EMISSIONS  (GRAMS/BAG)

NOX                2.51            0.83           1.66
HC                 2.28            1.36           1.36
CO                 5.64            0.94           2.57
CO2             2867.28         3038.72        2499.00

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.38
HC                 0.42
CO                 0.64
CO2              759.48

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.68
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                        ****** CVS 651 ******

                       *** IDENTIFICATION ***

TEST DATE: 10-6-75                   ROAD TEST: NA
VEHICLE:   ETV 24                    DRIVER: LARRY
MATERIAL: GEM 680D/OE                TEST MILES: 231

COMMENTS:          REPEAT OF TEST 650 - NOT PREPED DAY BEFORE
                   3786 CC = 11.1 MPG AT 29 DEGREE C FUEL

                          *** TEST DATA ***

TEMP: 63   F (WET)                   PRES: 747.935  MM HG (BARO)
      78   F (DRY)                          24.617  MM HG (VAPOR)
      96   F (MIX)                          25.375  IN. H20 (INLET)
RH:  43   %                                 19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                BLOWER SPEED:  3
FUEL: HO III                         CF/REV: .3013
BLOWER RPM (ACT): 928.574            BLOWER RPM (CAL): 928.481

                       BAG 1             BAG 2             BAG 3
                    AIR     EX        AIR     EX        AIR     EX

TIME (SECS)           504.85            867.65            504.7
BLOWER REVS           7812              13428             7812
CO  (PPM)          9.40  117.00    10.50   19.70    10.50   43.20
HC  (PPM C)        6.68   79.68     7.48   30.00     6.80   45.80
NOX (PPM)          0.06   26.05     0.17    5.44     0.20   16.26
CO2 (%)            0.04    2.80     0.05    1.83     0.06    2.43

                      *** CALCULATED RESULTS ***

                   BAG 1            BAG 2            BAG 3

VMIX (CF)         2060.33          3541.49          2060.33
DF                4.75367          7.30296          5.49487

CORRECTED CONCENTRATIONS

NOX (PPM)           26.00             5.29            16.10
HC  (PPM C)         74.41            23.54            40.24
CO  (PPM)          101.75             9.80            32.11
CO2 (%)              2.77             1.79             2.38

MASS EMISSIONS  (GRAMS/BAG)

NOX                  2.74             0.96             1.70
HC                   2.50             1.36             1.35
CO                   6.91             1.14             2.18
CO2               2974.55          3300.10          2558.21

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.41
HC                   0.43
CO                   0.71
CO2                804.98

FUEL ECONOMY  (MILES/GAL)

EPAMPG              11.11
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                        ****** CVS 652 ******

                       *** IDENTIFICATION ***

TEST DATE: 10-7-75               ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: LARRY
MATERIAL: GEM 68-0D/0E           TEST MILES: 241

COMMENTS:          .422 ORIFICE 12 BTDC PORTED VAC. HC NUMBERS ?
                   REAR VAC. BRK. .175 11.19 MPG 28 DEGREE C 3755 CC
                   GAS SPILED WHITCH AFFECTED HIGH HC IN AIR BAGS
                        *** TEST DATA ***

TEMP: 60  F (WET)                PRES: 752.435  MM HG (BARO)
      78  F (DRY)                      24.617  MM HG (VAPOR)
      99  F (MIX)                      25.55  IN. H20 (INLET)
RH:  33  %                             19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3012
BLOWER RPM (ACT): 928.623        BLOWER RPM (CAL): 928.464

                      BAG 1           BAG 2           BAG 3
                    AIR    EX       AIR    EX       AIR    EX

TIME (SECS)           504.5           868.3           505.4
BLOWER REVS           7809            13439           7821
CO  (PPM)         20.00  328.00  20.00   26.00  17.00   37.00
HC  (PPM C)       18.12  127.60  28.16   67.60  32.32   82.40
NOX (PPM)          0.61   23.10   0.75    5.90   0.65   15.90
CO2 (%)            0.04    2.65   0.05    1.68   0.05    2.40

                    *** CALCULATED RESULTS ***

                  BAG 1           BAG 2           BAG 3

VMIX (CF)          2059.94         3545.07         2063.1
DF                 4.97487         7.93252         5.55618

CORRECTED CONCENTRATIONS

NOX (PPM)           22.61            5.24            15.37
HC  (PPM C)        113.12           42.99            55.90
CO  (PPM)          291.96            7.59            21.10
CO2 (%)              2.62            1.64             2.36

MASS EMISSIONS  (GRAMS/BAG)

NOX                  2.23            0.89             1.52
HC                   3.81            2.49             1.88
CO                  19.83            0.89             1.44
CO2               2812.45         3025.13          2538.06

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.36
HC                   0.69
CO                   1.36
CO2                757.49

FUEL ECONOMY  (MILES/GAL)

EPAMPG              11.68
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                    ****** CVS 653 ******

                    *** IDENTIFICATION ***

TEST DATE: 10-8-75              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: MIKE K
MATERIAL: GEM 68-OD/OF          TEST MILES: 261

COMMENTS:          .422 ORIFICE 12 BTDC PORTED VAC. 28 DEGREE C
                   RESAR BRK. .175 HIGH VOL. AIR PUMP (26 CFM) 10.71 MPG

                    *** TEST DATA ***

TEMP: 58  F (WET)               PRES: 749.135  MM HG (BARO)
      75  F (DRY)                      22.243  MM HG (VAPOR)
      99  F (MIX)                      25.375  IN. H20 (INLET)
RH:  34  %                             19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3014
BLOWER RPM (ACT): 928.479       BLOWER RPM (CAL): 928.464

                     BAG 1             BAG 2             BAG 3
                  AIR     EX       AIR      EX       AIR      EX

TIME (SECS)          507.8             868.2             505.4
BLOWER REVS          7858              13433             7823
CO  (PPM)        29.00  274.00   31.00    36.00   34.00    71.00
HC  (PPM C)      19.20  126.00   20.12    48.80   18.20    78.40
NOX (PPM)         1.06   19.00    1.14     7.52    1.24    16.30
CO2 (%)           0.05    2.92    0.05     1.80    0.05     2.48

                    *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2065.71          3531.27          2056.51
DF               4.52984          7.41021          5.37177

CORRECTED CONCENTRATIONS

NOX (PPM)          18.17             6.53            15.29
HC  (PPM C)       111.04            31.40            63.59
CO  (PPM)         233.24             7.84            39.46
CO2 (%)             2.88             1.76             2.44

MASS EMISSIONS  (GRAMS/BAG)

NOX                 1.78             1.09             1.49
HC                  3.75             1.81             2.14
CO                 15.89             0.91             2.68
CO2              3103.65          3235.15          2616.08

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.36
HC                  0.62
CO                  1.24
CO2               808.12

FUEL ECONOMY  (MILES/GAL)

EPAMPG             10.93
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                    ****** CVS 654 ******

                   *** IDENTIFICATION ***

TEST DATE: 10:9:75             ROAD TEST: NA
VEHICLE:  ETV 24               DRIVER: LARRY
MATERIAL: GEM 68 OD/OE         TEST MILES: 280

COMMENTS:          .422 - 12 DEGREE BTDC - PORTED VAC. ADV. - NO EFE
                   HI VOL. AIR PUMP - 3855 CC = 10.90 MPG AT 28 DEGREE C FUE
L

                      *** TEST DATA ***

TEMP: 64   F (WET)                PRES: 747.185  MM HG (BARO)
      77   F (DRY)                      23.756  MM HG (VAPOR)
      95   F (MIX)                      25.375  IN. H20 (INLET)
RH:  48  %                              19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3016
BLOWER RPM (ACT): 928.508         BLOWER RPM (CAL): 928.464

                   BAG 1          BAG 2          BAG 3
                AIR    EX      AIR    EX      AIR    EX

TIME (SECS)       504.35         868.15         504.9
BLOWER REVS       7804           13433          7816
CO  (PPM)     11.90  279.00  13.00   20.40  14.10   24.60
HC  (PPM C)   11.08  110.00  11.56   36.88  10.72   50.20
NOX (PPM)      0.28   19.29   0.37    6.95   0.40   13.94
CO2 (%)        0.05    2.78   0.06    1.81   0.04    2.43

                   *** CALCULATED RESULTS ***

              BAG 1          BAG 2          BAG 3

VMIX (CF)      2061.61        3548.64        2064.78
DF             4.75688         7.38038        5.49783

CORRECTED CONCENTRATIONS

NOX (PPM)       19.07           6.63          13.61
HC  (PPM C)    101.25          26.89          41.43
CO  (PPM)      250.49           8.31          11.71
CO2 (%)          2.74           1.76           2.40

MASS EMISSIONS  (GRAMS/BAG)

NOX              2.06           1.23           1.47
HC               3.41           1.56           1.40
CO              17.03           0.97           0.80
CO2           2946.40        3253.62        2581.34

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX              0.39
HC               0.51
CO               1.17
CO2            798.92

FUEL ECONOMY  (MILES/GAL)

EPAMPG          11.15
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                      ****** CVS 655 ******

                      *** IDENTIFICATION ***

TEST DATE: 10-10-75               ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: LARRY
MATERIAL: GEM 68-OD/OE            TEST MILES: 300

COMMENTS:         .422-12 BTDC- .175 - PORTED VAC. - DUP. OF 654
                  HIGH VOL. AIR PUMP 3973 CC = 10.57 MPG AT 28 DEGREE C

                         *** TEST DATA ***

TEMP: 63   F (WET)                PRES: 748.235  MM HG (BARO)
      78   F (DRY)                      24.617  MM HG (VAPOR)
      99   F (MIX)                      25.375  IN. H2O (INLET)
RH:  43   %                             19.425  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3013
BLOWER RPM (ACT): 928.562         BLOWER RPM (CAL): 928.481

                      BAG 1            BAG 2            BAG 3
                   AIR     EX       AIR     EX       AIR     EX

TIME (SECS)           505             867.7            505.3
BLOWER REVS           7815            13430            7819
CO  (PPM)        10.00  241.00   11.00    19.00   11.00    41.00
HC  (PPM C)       8.52   84.40    8.36    33.20    8.00    51.60
NOX (PPM)         0.24   20.00    0.32     6.86    0.32    12.50
CO2 (%)           0.04    2.80    0.04     1.88    0.04     2.56

                     *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)        2050.78          3524.24          2051.83
DF               4.73347          7.10828          5.21604

CORRECTED CON CENTRATIONS

NOX (PPM)          19.81             6.59            12.24
HC  (PPM C)        77.68            26.02            45.13
CO  (PPM)         216.89             8.73            29.64
CO2 (%)             2.77             1.85             2.53

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.08             1.19             1.28
HC                  2.60             1.50             1.51
CO                 14.66             1.01             2.01
CO2              2960.80          3392.06          2704.67

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.37
HC                  0.46
CO                  1.13
CO2               827.58

FUEL ECONOMY  (MILES/GAL)

EPAMPG             10.82
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                        ****** CVS 656 ******

                        *** IDENTIFICATION ***

TEST DATE: 10-14-75                    ROAD TEST: NA
VEHICLE:   ETV 24                      DRIVER: LARRY
MATERIAL: GEM 68-OB/OF                 TEST MILES: 770

COMMENTS:        .422 ORIFICE .175 REAR BRK. PORTED VAC. 12 BTDC
                 4 INCH SYSTEM 3802 CC = 11.05 MPG  29 DEGREE C

                          *** TEST DATA ***

TEMP: 62   F (WET)                     PRES: 746.285  MM HG (BARO)
      75   F (DRY)                            22.243  MM HG (VAPOR)
      99   F (MIX)                            25.375  IN. H20 (INLET)
RH:  47  %                                    19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                  BLOWER SPEED:  3
FUEL: HO III                           CF/REV: .3014
BLOWER RPM (ACT): 928.339              BLOWER RPM (CAL): 928.481

                       BAG 1             BAG 2              BAG 3
                    AIR     EX        AIR     EX         AIR     EX

TIME (SECS)            505.2            867.8               505
BLOWER REVS            7815             13428               7814
CO   (PPM)        24.00   228.00    57.00    56.00     37.00  138.00
HC   (PPM C)       8.32   132.00    11.76    32.80     10.88   57.20
NOX  (PPM)         0.28    19.70     0.56     6.80      0.36   15.20
CO2  (%)           0.04     2.89     0.04     1.80      0.04    2.52

                      *** CALCULATED RESULTS ***

                   BAG 1             BAG 2              BAG 3

VMIX (CF)          2046.11           3515.7             2045.85
DF                 4.58216           7.40904            5.27841

CORRECTED CONCENTRATIONS

NOX (PPM)            19.48              6.32              14.91
HC   (PPM C)        125.50             22.63              48.38
CO   (PPM)          193.38              4.65              99.68
CO2 (%)               2.86              1.77               2.49

MASS EMISSIONS  (GRAMS/BAG)

NOX                   2.03              1.13               1.56
HC                    4.19              1.30               1.62
CO                   13.05              0.54               6.72
CO2                3050.40           3236.75            2654.02

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.39
HC                    0.54
CO                    1.33
CO2                 808.16

FUEL ECONOMY  (MILES/GAL)

EPAMPG               10.95
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                    ****** CVS 658 ******

                   *** IDENTIFICATION ***

TEST DATE: 10-16-75            ROAD TEST: NA
VEHICLE:   ETV 24              DRIVER: LARRY
MATERIAL:  GEM 68-0B/0F        TEST MILES: 790

COMMENTS:        .422 ORIFICE .175 DEPTH .044 RODS PORTED VAC. 27 DEGREE C
                 REAR VAC. BRK.   .154  IDLE SPEED (COLD) +   10.45 MPG

                      *** TEST DATA ***

TEMP:  67   F (WET)            PRES: 746.085  MM HG (BARO)
       73   F (DRY)                   20.815  MM HG (VAPOR)
       98   F (MIX)                   25.375  IN. H2O (INLET)
RH:   73  %                           19.425  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3014
BLOWER RPM (ACT): 928.366      BLOWER RPM (CAL): 928.481

                        BAG 1           BAG 2           BAG 3
                      AIR    EX       AIR    EX       AIR    EX

TIME (SECS)             505.4           869.4           505.6
BLOWER REVS             7819            13452           7824
CO   (PPM)          12.00  225.00   15.00   21.00   12.00   27.00
HC   (PPM C)         8.92   97.20    8.12   31.52    7.28   44.80
NOX (PPM)            0.40   42.90    0.65    6.63    0.55   24.00
CO2 (%)              0.04    3.20    0.04    1.93    0.04    2.52

                  *** CALCULATED RESULTS ***

                    BAG 1          BAG 2          BAG 3

VMIX (CF)          2050.35        3527.47        2051.66
DF                 4.14822        6.92462        5.30276

CORRECTED CONCENTRATIONS

NOX (PPM)            42.60           6.07          23.55
HC   (PPM C)         90.43          24.57          38.89
CO   (PPM)          196.94           7.19          15.55
CO2 (%)               3.17           1.90           2.49

MASS EMISSIONS  (GRAMS/BAG)

NOX                   5.10           1.25           2.82
HC                    3.03           1.42           1.30
CO                   13.31           0.84           1.05
CO2                3389.16        3487.42        2661.52

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.67
HC                    0.46
CO                    0.95
CO2                 861.58

FUEL ECONOMY  (MILES/GAL)

EPAMPG               10.28
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                     ****** CVS 660 ******

                    *** IDENTIFICATION ***

TEST DATE: 10-17-75               ROAD TEST: NA
VEHICLE:   ETV 24                 DRIVER: LARRY
MATERIAL:  GEM 68-0B/0F           TEST MILES: 825

COMMENTS:      FRONT  BRK. .190 PORTED VAC. 12 BTDC
               CON V.  AFTER CVS DRIVER 97/86 PASS. 97/88 10.54 MOG.

                       *** TEST DATA ***

TEMP: 60   F (WET)                PRES: 747.385  MM HG (BARO)
      80   F (DRY)                      26.271  MM HG (VAPOR)
      98   F  (MIX)                      25.375  IN. H20 (INLET)
RH:  29   %                              19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3013
BLOWER RPM (ACT): 928.492         BLOWER RPM (CAL): 928.481

                     BAG 1            BAG 2             BAG 3
                  AIR     EX       AIR      EX       AIR      EX

TIME (SECS)          505.1             868             505.3
BLOWER REVS          7817             13432             7819
CO  (PPM)        26.00 1058.00   26.00    28.00   13.00    34.00
HC  (PPM C)       9.44  137.60   10.32    35.04    9.36    49.20
NOX (PPM)         0.45   24.00    0.61     8.06    0.39    20.50
CO2 (%)           0.04    3.06    0.04     1.96    0.04     2.54

                   *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2052.94          3527.58          2053.47
DF               4.22402          6.81527          5.25878

CORRECTED CONCENTRATIONS

NOX (PPM)          23.66             7.54            20.18
HC  (PPM C)       130.39            26.23            41.62
CO  (PPM)         966.11             4.70            21.59
CO2 (%)             3.03             1.93             2.51

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.30             1.26             1.97
HC                  4.37             1.51             1.40
CO                 65.39             0.55             1.46
CO2              3243.37          3542.89          2685.35

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.45
HC                  0.56
CO                  3.93
CO2               862.43

FUEL ECONOMY  (MILES/GAL)

EPAMPG             10.26
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                       ****** CVS 661 ******

                       *** IDENTIFICATION ***

TEST DATE: 10-18-75                 ROAD TEST: NA
VEHICLE:   ETV 24                   DRIVER: LARRY
MATERIAL: GEM 68-OB/OF              TEST MILES: 850

COMMENTS:        .044 RODS .072 JETS .200 FRONT BRK.
                 NO HOT START P. A. 10.31 MPG. 27 DEGREE C

                         *** TEST DATA ***

TEMP: 60   F (WET)                  PRES: 740.185  MM HG (BARO)
      78   F (DRY)                        24.617  MM HG (VAPOR)
      97   F (MIX)                        25.2   IN. H20 (INLET)
RH:   33   %                              19.075  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3012
BLOWER RPM (ACT): 928.237           BLOWER RPM (CAL): 928.534

                     BAG 1          BAG 2           BAG 3
                  AIR     EX     AIR     EX      AIR     EX

TIME (SECS)          504.8          868.3           505.3
BLOWER REVS          7810           13432           7818
CO  (PPM)        9.40  758.00  13.00   19.00    7.40   36.00
HC  (PPM C)      6.48  180.40   7.92   33.76    6.84   61.20
NOX (PPM)        0.34   16.60   0.62   10.00    0.54   17.20
CO2 (%)          0.04    3.24   0.04    2.00    0.04    2.64

                    *** CALCULATED RESULTS ***

                 BAG 1           BAG 2           BAG 3

VMIX (CF)        2033.85         3497.91         2035.93
DF               4.02607         6.68268         5.05756

CORRECTED CONCENTRATIONS

NOX (PPM)          16.34            9.47           16.77
HC  (PPM C)       175.53           27.03           55.71
CO  (PPM)         695.65            7.13           27.91
CO2 (%)             3.21            1.97            2.61

MASS EMISSIONS  (GRAMS/BAG)

NOX                 1.60            1.59            1.64
HC                  5.33            1.54            1.85
CO                 46.65            0.82            1.87
CO2              3404.62         3586.27         2768.92

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.43
HC                  0.68
CO                  2.93
CO2               883.81

FUEL ECONOMY  (MILES/GAL)

EPAMPG              9.98
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1ST 14.25 cc

2ND .293.2cc

3RD 4075 cc

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                     ****** CVS 662 ******

                     *** IDENTIFICATION ***

TEST DATE: 10-20-75             ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: LARRY
MATERIAL:  GEM 68-OB/OF         TEST MILES: 870

COMMENTS:       .044 RODS .072 JETS .200 FRONT BRK.
                NO  HOT START P. A. 10.29 MPG  25 DEGREE C

                        *** TEST DATA ***

TEMP: 57   F (WET)              PRES: 743.185  MM HG (BARO)
      74   F (DRY)                     21.453  MM HG (VAPOR)
      97   F  (MIX)                     25.375  IN. H20 (INLET)
RH:  33  %                             19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3017
BLOWER RPM (ACT): 928.475       BLOWER RPM (CAL): 928.481

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          505              868.2             505.3
BLOWER REVS          7814             13435             7820
CO  (PPM)         8.20   625.00   14.00    19.00    9.90    22.00
HC  (PPM C)       6.40   119.60    7.28    31.92    6.56    48.40
NOX (PPM)         0.31    16.30    0.49     6.63    0.41    18.00
CO2 (%)           0.04     3.08    0.08     1.92    0.04     2.64

                   *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)         2045.75          3517.36          2047.32
DF                4.25385          6.96103          5.06252

CORRECTED CONCENTRATIONS

NOX (PPM)           16.06             6.21            17.67
HC  (PPM C)        114.70            25.69            43.14
CO  (PPM)          575.08             6.23            12.79
CO2 (%)              3.05             1.85             2.61

MASS EMISSIONS  (GRAMS/BAG)

NOX                  1.54             1.02             1.70
HC                   3.83             1.48             1.44
CO                  38.79             0.72             0.86
CO2               3253.28          3396.20          2784.40

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.35
HC                   0.53
CO                   2.39
CO2                850.96

FUEL ECONOMY  (MILES/GAL)

EPAMPG              10.35
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1st 1429 cc

2ND 2931 cc

3RD 4082 cc

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                    ****** CVS 663 ******

                   *** IDENTIFICATION ***

TEST DATE: 10-31-75           ROAD TEST: NA
VEHICLE:   ETV 24             DRIVER: LARRY
MATERIAL:  GEM 68-0B/0F       TEST MILES: 900

COMMENTS:        CAR WAS SITTING FOR TWO WEEKS WE DID PREP. IT
                 LAST NIGHT  SAME AS RUN 662   9.92 mpg.

                      *** TEST DATA ***

TEMP: 52   F (WET)            PRES: 755.535  MM HG (BARO)
      74   F (DRY)                   21.453  MM HG (VAPOR)
      98   F (MIX)                   25.725  IN. H20 (INLET)
RH:  17  %                           20.125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS         BLOWER SPEED:  3
FUEL: HO III                  CF/REV: .3020
BLOWER RPM (ACT): 928.19      BLOWER RPM (CAL): 928.375

                       BAG 1            BAG 2            BAG 3
                     AIR    EX        AIR    EX        AIR     EX

TIME (SECS)            505.6            868.1            504.6
BLOWER REVS            7821             13431            7805
CO  (PPM)          17.00   590.00   13.00    20.00   13.00    40.00
HC  (PPM C)         5.24   139.20    8.64    32.56    7.32    53.60
NOX (PPM)           0.81    15.00    0.79     9.64    0.90    16.70
CO2 (%)             0.04     2.90    0.04     1.96    0.04     2.60

                  *** CALCULATED RESULTS ***

                    BAG 1            BAG 2            BAG 3

VMIX (CF)          2080.84          3573.42          2076.58
DF                 4.51284          6.81875          5.1358

CORRECTED CONCENTRATIONS

NOX (PPM)           14.37             8.97            15.98
HC  (PPM C)        135.12            25.19            47.71
CO  (PPM)          540.66             8.10             27.37
CO2 (%)              2.87             1.93             2.57

MASS EMISSIONS  (GRAMS/BAG)

NOX                  1.29             1.38             1.43
HC                   4.59             1.47             1.62
CO                  37.09             0.95             1.87
CO2               3113.17          3588.93          2780.75

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.37
HC                   0.58
CO                   2.40
CO2                868.35

FUEL ECONOMY  (MILES/GAL)

EPAMPG              10.29
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                    ****** CVS 664 ******

                   *** IDENTIFICATION ***

TEST DATE: 11-3-7 5                ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: LARRY
MATERIAL: GEM 68-0B/OF             TEST MILES: 925

COMMENTS:        .406 ORIFICE CAR HAS NOT BEEN RUN FOR TWO DAYS
                 12 BTDC PORTED VAC. 9.94 MPG.

                     *** TEST DATA ***

TEMP: 63   F  (W ET)                 PRES: 749.435  MM HG (BARO)
      78   F (DRY)                          24.617  MM HG (VAPOR)
      90   F (MIX)                          25.2   IN. H20 (INLET)
RH:  43  %                                  19.6   IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3011
BLOWER RPM (ACT): 928.456          BLOWER RPM (CAL): 928.481

                     BAG 1           BAG 2            BAG 3
                   AIR    EX       AIR    EX        AIR     EX

TIME (SECS)           505.6           870.3            504.9
BLOWER REVS           7824            13467            7813
CO   (PPM)       10.00  582.00    7.40   18.00     7.60    26.00
HC   (PPM C)      6.48  150.80    6.16   33.04     6.12    49.20
NOX (PPM)         0.26   18.50    0.49   10.70     0.60    20.20
CO2 (%)           0.04    3.08    0.04    2.00     0.04     2.72

                   *** CALCULATED RESULTS ***

                   BAG 1           BAG 2            BAG 3

VMIX (CF)         2090.45         3598.17          2087.51
DF                4.25529         6.68326          4.9132

CORRECTED CONCENTRATIONS

NOX (PPM)           18.30           10.28            19.72
HC   (PPM C)       145.84           27.80            44.33
CO   (PPM)         531.87           10.85            18.31
CO2 (%)              3.05            1.97             2.69

MASS EMISSIONS  (GRAMS/BAG)

NOX                  1.96            1.89             2.10
HC                   4.98            1.63             1.51
CO                  36.66            1.29             1.26
CO2               3324.36         3689.06          2926.41

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.52
HC                   0.62
CO                   2.37
CO2                904.88

FUEL ECONOMY  (MILES/GAL)

EPAMPG               9.82
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                  ****** CVS 666 ******

                  *** IDENTIFICATION ***

TEST DATE: 11-5-75             ROAD TEST: NA
VEHICLE:   ETV 24              DRIVER: LARRY
MATERIAL: GEM 68-0B/0F         TEST MILES: 950

COMMENTS:       .406 ORIFICE ANEROID LEAND OUT A LITTLE
                12 BTDC PORTED VAC. 10.1 MPG.

                    *** TEST DATA ***

TEMP: 63   F (WET)             PRES: 747.135  MM HG (BARO)
      75   F (DRY)                    22.243  MM HG (VAPOR)
      90   F (MIX)                    25.025  IN. H20 (INLET)
RH:   51   %                          19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3009
BLOWER RPM (ACT): 928.532      BLOWER RPM (CAL): 928.516

                      BAG 1           BAG 2           BAG 3
                   AIR     EX      AIR     EX      AIR     EX

TIME (SECS)           505.3          868.7            506
BLOWER REVS           7821           13442            7831
CO  (PPM)         6.90  575.00    9.50   17.00    7.90   37.00
HC  (PPM C)       6.32  145.20    6.24   34.04    6.32   58.00
NOX (PPM)         0.49   19.00    0.49   10.30    0.49   20.40
CO2 (%)           0.04    3.24    0.04    2.08    0.04    2.72

                 *** CALCULATED RESULTS ***

                 BAG 1           BAG 2           BAG 3

VMIX (CF)        2081.83         3578.06         2084.5
DF               4.05141         6.42683         4.90978

CORRECTED CON CENTRATIONS

NOX (PPM)         18.63            9.89           20.01
HC  (PPM C)      140.44           28.77           52.97
CO  (PPM)        524.55            8.15           28.27
CO2 (%)            3.21            2.05            2.69

MASS EMISSIONS  (G RAMS/BAG)

NOX                2.02            1.85            2.18
HC                 4.77             1.68            1.80
CO                36.00            0.96            1.94
CO2             3484.88         3818.17         2922.19

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.53
HC                 0.63
CO                 2.34
CO2              930.98

FUEL ECONOMY  (MILES/GAL)

EPAMPG             9.55
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                        ****** CVS 671 ******

                        *** IDENTIFICATION ***

TEST DATE: 11-7-75                  ROAD TEST: NA
VEHICLE:   ETV 24                   DRIVER: MIKE K
MATERIAL:  GEM 68-0B/0F             TEST MILES: 970

COMMENTS:       .302 ORIFICE 12 BTDC PORTED VAC.
                CARB. UNCHANGE [redacted]  10.43 MPG.

                          *** TEST DATA ***

TEMP: 64   F (WET)                  PRES: 743.185  MM HG (BARO)
      75   F (DRY)                        22.243  MM HG (VAPOR)
      100   F  (MIX)                       24.5   IN. H20 (INLET)
RH:  54  %                                18.9   IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .2998
BLOWER RPM (ACT): 928.466           BLOWER RPM (CAL): 928.622

                        BAG 1          BAG 2          BAG 3
                     AIR    EX      AIR    EX      AIR     EX

TIME (SECS)             506.2          870.7          506.4
BLOWER REVS             7833           13472          7838
CO   (PPM)         12.00  409.00   15.00   19.00   12.00   25.00
HC   (PPM C)       10.04  128.00   10.20   33.00    8.96   52.00
NOX (PPM)           0.48   41.70    0.82   12.50    0.52   39.00
CO2 (%)             0.04    3.08    0.04    1.88    0.04    2.58

                      *** CALCULATED RESULTS ***

                   BAG 1           BAG 2            BAG 3

VMIX (CF)          2031.73         3494.38          2033.03
DF                 4.28038         7.10838          5.17868

CORRECTED CONCENTRATIONS

NOX (PPM)            41.33           11.80            38.58
HC   (PPM C)        120.31           24.23            44.77
CO   (PPM)          368.58            5.32            13.81
CO2 (%)               3.05            1.85             2.55

MASS EMISSIONS  (G RAMS/BAG)

NOX                   4.47            2.20             4.18
HC                    3.99            1.38             1.49
CO                   24.69            0.61             0.93
CO2                3230.93         3363.33          2701.16

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.87
HC                    0.53
CO                    1.57
CO2                 838.97

FUEL ECONOMY  (MILES/GAL)

EPAMPG               10.53
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                         ****** CVS 675 ******

                         *** IDENTIFICATION ***

TEST DATE: 11-8-75                  ROAD TEST: NA
VEHICLE:  ETV 24                    DRIVER: MIKE K
MATERIAL: GEM 68-0B/0F              TEST MILES: 980

COMMENTS:         STOCK EGR  12 BTDC P.V. HIGH VOL. AIR  PUMP
                  4021 CC 10.45 MPG.

                           *** TEST DATA ***

TEMP: 66   F (WET)                  PRES: 741.585  MM HG (BARO)
      79   F (DRY)                         25.509  MM HG (VAPOR)
      105  F (MIX)                         24.5  IN. H2O (INLET)
RH:  50  %                                 18.9  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .2999
BLOWER RPM (ACT): 928.511           BLOWER RPM (CAL): 928.622

                         BAG 1             BAG 2             BAG 3
                      AIR     EX        AIR     EX        AIR     EX

TIME (SECS)             506.3             869.4             505.7
BLOWER REVS             7835              13455             7825
CO  (PPM)           11.00  562.00   15.00    19.00   11.00    43.00
HC  (PPM C)         11.52  139.60   10.96    38.00   10.44    70.00
NOX (PPM)            1.02   28.30    0.90    12.00    0.81    32.40
CO2 (%)              0.04    3.16    0.04     1.88    0.04     2.48

                      *** CALCULATED RESULTS ***

                    BAG 1             BAG 2             BAG 3

VMIX (CF)           2010.49           3452.6            2007.92
DF                  4.15396           7.10649           5.37931

CORRECTED CONCENTRATIONS

NOX (PPM)             27.53             11.23             31.74
HC  (PPM C)          130.85             28.58             61.50
CO  (PPM)            510.52              5.32             31.44
CO2 (%)                3.13              1.85              2.45

MASS EMISSIONS  (GRAMS/BAG)

NOX                    3.01              2.11              3.47
HC                     4.30              1.61              2.02
CO                    33.84              0.61              2.08
CO2                 3281.32           3323.11           2562.78

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                    0.72
HC                     0.61
CO                     2.18
CO2                  825.98

FUEL ECONOMY  (MILES/GAL)

EPAMPG                10.65
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                    ****** CVS 681 ******

                   *** IDENTIFICATION ***

TEST DATE: 11-12-75             ROAD TEST: NA
VEHICLE:   ETV  24               DRIVER: MIKE K
MATERIAL: GEM 68 OB/OF          TEST MILES: 1000

COMMENTS:        STOCK EGR - STOCK TIMING - STOCK MAN. VAC.ADV.
                 3696 CC = 11.37 MPG  CARB HAS LEAN HOLES - NOT ADJUSTED

                       *** TEST DATA ***

TEMP: 62   F (WET)              PRES: 738.285  MM HG (BARO)
      79   F (DRY)                    25.509  MM HG (VAPOR)
      101  F (MIX)                    24.85  IN. H20 (INLET)
RH:  37  %                            19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3015
BLOWER RPM (ACT): 928.38        BLOWER RPM (CAL): 928.516

                     BAG 1          BAG 2          BAG 3
                   AIR    EX      AIR    EX      AIR    EX

TIME (SECS)          505.4          869.2          507
BLOWER REVS          7820           13449          7845
CO  (PPM)        10.60  345.00  11.90   17.40  11.20   25.60
HC  (PPM C)       9.08   73.44   9.92   35.32   8.96   56.68
NOX (PPM)         0.77   37.22   0.74   10.41   0.59   37.12
CO2 (%)           0.04    2.43   0.06    1.61   0.06    2.39

                  *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)       2020.43        3474.78        2026.89
DF              5.4255         8.2962         5.5878

CORRECTED CONCENTRATIONS

NOX (PPM)         36.59           9.76          36.64
HC  (PPM C)       66.03          26.60          49.32
CO  (PPM)        316.20           6.31          15.03
CO2 (%)            2.40           1.56           2.34

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.68           1.69           3.70
HC                 2.18           1.51           1.63
CO                21.06           0.72           1.00
CO2             2526.00        2821.85        2474.21

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.72
HC                 0.45
CO                 1.38
CO2              709.11

FUEL ECONOMY  (MILES/GAL)

EPAMPG            12.51
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                    ****** CVS 683 ******

                   *** IDENTIFICATION ***

TEST DATE: 11-13-75            ROAD TEST: NA
VEHICLE:  ETV 24               DRIVER: MIKE K
MATERIAL: GEM 68-0B/0F         TEST MILES: 1015

COMMENTS:       STOCK TIMMING-EGR-MAN. VAC. ADV.
                11.12MPG.

                     *** TEST DATA ***

TEMP: 53   F (WET)             PRES: 738.985  MM HG (BARO)
      71   F (DRY)                   19.468  MM HG (VAPOR)
     100   F (MIX)                   24.5  IN. H20 (INLET)
RH:  27  %                           19.075  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3003
BLOWER RPM (ACT): 928.562      BLOWER RPM (CAL): 928.605

                      BAG 1          BAG 2          BAG 3
                    AIR    EX      AIR    EX      AIR    EX

TIME (SECS)           507.9          868.3          507.1
BLOWER REVS           7861           13437          7848
CO  (PPM)          8.10  532.00  11.00   17.00  10.00   25.00
HC  (PPM C)        6.72  148.40   7.40   29.68   9.40   56.80
NOX (PPM)          0.76   62.40   0.87   11.30   0.78   55.40
CO2 (%)            0.04    2.90   0.04    1.76   0.04    2.67

                  *** CALCULATED RESULTS ***

                  BAG 1          BAG 2          BAG 3

VMIX (CF)         2030.45        3470.69        2027.09
DF                4.51999        7.59381        5.00368

CORRECTED CONCENTRATIONS

NOX (PPM)           61.81          10.54          54.78
HC  (PPM C)        143.17          23.25          49.28
CO  (PPM)          491.41           6.81          15.57
CO2 (%)              2.87           1.73           2.64

MASS EMISSIONS  (GRAMS/BAG)

NOX                  5.64           1.64           4.99
HC                   4.75           1.32           1.63
CO                  32.90           0.78           1.04
CO2               3037.76        3122.68        2788.69

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.92
HC                   0.57
CO                   2.07
CO2                802.46

FUEL ECONOMY  (MILES/GAL)

EPAMPG              10.91
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                         ****** CVS 698 ******

                        *** IDENTIFICATION ***

TEST DATE: 11-18-75                 ROAD TEST: NA
VEHICLE:   ETV 24                   DRIVER: LARRY
MATERIAL:  GEM NONE                 TEST MILES: 5347

COMMENTS:         STOCK EX. SYSTEM   CARB. AIR PUMP TIMMING MAN. VAC. ADV.
                  3524 CC = 11.92 MPG.

                          *** TEST DATA ***

TEMP:  61   F (WET)                 PRES: 753.435  MM HG (BARO)
       79   F (DRY)                        25.509  MM HG (VAPOR)
      102   F (MIX)                        25.025  IN. H20 (INLET)
RH:  34  %                                 19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3004
BLOWER RPM (ACT): 928.374           BLOWER RPM (CAL): 928.516

                       BAG 1            BAG 2            BAG 3
                    AIR     EX       AIR     EX       AIR     EX

TIME (SECS)            504.4            868.1            505.3
BLOWER REVS            7804             13432            7819
CO   (PPM)          9.00 1562.00    12.90    17.70    38.20    67.90
HC   (PPM C)       10.20  218.48    10.00    33.76    10.72    56.64
NOX  (PPM)          0.96   95.10     1.12    33.00     1.14    98.51
CO2  (%)            0.04    2.67     0.04     1.56     0.06     2.31

                       *** CALCULATED RESULTS ***

                    BAG 1            BAG 2            BAG 3

VMIX (CF)          2047.89          3524.77          2051.83
DF                 4.72113          8.5619           5.77069

CORRECTED CONCENTRATIONS

NOX  (PPM)           94.34            32.01            97.57
HC   (PPM C)        210.44            24.93            47.78
CO   (PPM)         1457.55             5.71            32.90
CO2  (%)              2.64             1.52             2.26

MASS EMISSIONS  (GRAMS/BAG)

NOX                   9.39             5.48             9.73
HC                    7.04             1.43             1.60
CO                   98.41             0.66             2.23
CO2                2817.83          2802.60          2418.69

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   2.01
HC                    0.72
CO                    5.90
CO2                 719.06

FUEL ECONOMY  (MILES/GAL)

EPAMPG               11.97
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                    ****** CVS 699 ******

                    *** IDENTIFICATION ***

TEST DATE: 11-19-75               ROAD TEST: NA
VEHICLE:   ETV 24                 DRIVER: LARRY
MATERIAL:  GEM NONE               TEST MILES: 5379

COMMENTS:       2ND BASELINE IN STOCK CONDITION   3629 CC
                NO CHANRGES FROM 1ST TEST  11.57 MPG.

                    *** TEST DATA ***

TEMP: 58   F (WET)                PRES: 753.015  MM HG (BARO)
      75   F (DRY)                       22.243  MM HG (VAPOR)
      102  F (MIX)                       25.025  IN. H20 (INLET)
RH:  34  %                               19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3004
BLOWER RPM (ACT): 928.277         BLOWER RPM (CAL): 928.516

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          506.1            867.2            505.6
BLOWER REVS          7830             13417            7822
CO  (PPM)        19.00 1480.00    16.00    22.00    15.00    38.00
HC  (PPM C)       9.24  181.60     9.76    32.72    11.04    55.20
NOX (PPM)         0.73   98.40     1.07    34.50     1.29   105.00
CO2 (%)           0.04    2.60     0.04     1.56     0.04     2.42

                    *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)         2053.72          3519.12          2051.62
DF                4.86013          8.56021          5.51644

CORRECTED CONCENTRATIONS

NOX (PPM)           97.82            33.55           103.94
HC  (PPM C)        174.26            24.10            46.16
CO  (PPM)         1374.75             7.12            23.67
CO2 (%)              2.57             1.52             2.39

MASS EMISSIONS  (GRAMS/BAG)

NOX                  9.50             5.58            10.09
HC                   5.84             1.38             1.55
CO                  93.09             0.83             1.50
CO2               2750.61          2798.11          2554.17

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  2.06
HC                   0.64
CO                   5.57
CO2                724.90

FUEL ECONOMY  (MILES/GAL)

EPAMPG              11.89
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                        ****** CVS 706 ******

                       *** IDENTIFICATION ***

TEST DATE: 11-25-75               ROAD TEST: NA
VEHICLE:   ETV 24                 DRIVER: MIKE K
MATERIAL:  GEM 68-OB/O F           TEST MILES: 1929

COMMENTS:      STOCK TIMMING-MAN. VAC. ADV. - STOCK EGR CARB. SETTINGS A
PPROX.
               2C CATALYST ON 4 INCH 1ST TEST  3796 CC = 11.06 MPG.

                         *** TEST DATA ***

TEMP: 54   F (WET)                PRES: 743.985  MM HG (BARO)
      73   F (DRY)                       20.815  MM HG (VAPOR)
      99   F (MIX)                       25.375  IN. H2O (INLET)
RH:  25  %                               19.6  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3018
BLOWER RPM (ACT): 928.442         BLOWER RPM (CAL): 928.464

                     BAG 1             BAG 2             BAG 3
                  AIR     EX        AIR     EX        AIR     EX

TIME (SECS)         505.7             868.15            505.75
BLOWER REVS         7826              13433             7826
CO  (PPM)        7.90   433.00     8.30    15.00     6.20    24.00
HC  (PPM C)     10.76   123.60     8.36    29.44     7.56    48.40
NOX (PPM)        0.95    46.70     0.72    11.40     0.59    37.40
CO2 (%)          0.04     2.72     0.04     1.64     0.04     2.36

                     *** CALCULATED RESULTS ***

                  BAG 1             BAG 2             BAG 3

VMIX (CF)        2044.95           3510.07           2044.95
DF               4.83224           8.14895           5.66091

CORRECTED CONCENTRATIONS

NOX (PPM)          45.95             10.77             36.91
HC  (PPM C)       115.07             22.11             42.18
CO  (PPM)         400.62              7.18             17.65
CO2 (%)             2.69              1.60              2.33

MASS EMISSIONS  (GRAMS/BAG)

NOX                 4.21              1.69              3.38
HC                  3.84              1.27              1.41
CO                 27.01              0.83              1.19
CO2              2866.89           2937.79           2481.68

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.72
HC                  0.50
CO                  1.75
CO2               744.68

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.79
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                    ****** CVS 711 ******

                   *** IDENTIFICATION ***

TEST DATE: 11-26-75           ROAD TEST: NA
VEHICLE:   ETV 24             DRIVER: LARRY
MATERIAL:  GEM 68-OB/OF       TEST MILES: 1940

COMMENTS:        ONLY CHANGE TO VEHICLE WAS EGR VALVE
                 VALVE IS DUAL DAAIAPHRAGEM ( CAILF. ) 3936 CC = 11.1 MPG.

                    *** TEST DATA ***

TEMP:  54   F (WET)           PRES:  752.935  MM HG (BARO)
       73   F (DRY)                   20.815  MM HG (VAPOR)
       99   F (MIX)                   25.375  IN. H20 (INLET)
RH:   25   %                          19.6    IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS         BLOWER SPEED:  3
FUEL: HO III                  CF/REV: .3011
BLOWER RPM (ACT): 928.413     BLOWER RPM (CAL): 928.464

                    BAG 1           BAG 2           BAG 3
                  AIR    EX       AIR    EX       AIR    EX

TIME (SECS)          506.1           868.2           505.1
BLOWER REVS          7831            13433           7817
CO  (PPM)        23.30  612.00   23.80   26.50   9.10   20.60
HC  (PPM C)       6.60  139.92    7.84   27.36   6.80   36.64
NOX (PPM)         0.46   27.33    0.79    8.68   0.70   22.20
CO2 (%)           0.05    3.24    0.05    1.63   0.07    2.46

                 *** CALCULATED RESULTS ***

                  BAG 1           BAG 2           BAG 3

VMIX (CF)        2067.72         3546.89         2064.02
DF               4.04726         8.19431         5.43476

CORRECTED CONCENTRATIONS

NOX (PPM)          26.98            7.99           21.63
HC  (PPM C)       134.95           20.48           31.09
CO  (PPM)         551.49            4.73           12.09
CO2 (%)             3.20            1.59            2.40

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.50            1.27            2.00
HC                  4.56            1.19            1.05
CO                 37.60            0.55            0.82
CO2              3453.15         2933.82         2586.43

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.46
HC                  0.50
CO                  2.29
CO2               785.72

FUEL ECONOMY  (MILES/GAL)

EPAMPG             10.88
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                    ****** CVS 714 ******

                  *** IDENTIFICATION ***.

TEST DATE: 12-2-75                  ROAD TEST: NA
VEHICLE:   ETV 24                   DRIVER: LARRY
MATERIAL: GEM 68-OB/OF              TEST MILES: 1973

COMMENTS:         COLD IDLE SPEED 1600 IN NETURAL
                  CHOKE LEANED OUT .030 FRONT & REAR  11.07 MPG.

                      *** TEST DATA ***

TEMP: 52   F (WET)                  PRES: 744.685  MM HG (BARO)
      73   F (DRY)                        20.815  MM HG (VAPOR)
      105  F (MIX)                        24.7625  IN. H20 (INLET)
RH:   19   %                              19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3007
BLOWER RPM (ACT): 928.453           BLOWER RPM (CAL): 928.543

                     BAG 1            BAG 2            BAG 3
                  AIR    EX       AIR     EX       AIR     EX

TIME (SECS)         506.3            867              505.05
BLOWER REVS         7835            13416              7815
CO  (PPM)        5.70  165.00   20.00   22.00    11.00   24.00
HC  (PPM C)      7.20   75.20    7.88   27.96     7.48   38.76
NOX (PPM)        0.54   42.40    0.81    9.83     0.57   23.90
CO2 (%)          0.04    2.95    0.04    1.84     0.04    2.56

                  *** CALCULATED RESULTS ***

                BAG 1            BAG 2            BAG 3

VMIX (CF)       2023.33          3464.59          2018.17
DF              4.50726          7.26325          5.22184

CORRECTED CONCENTRATIONS

NOX (PPM)         41.98             9.13            23.44
HC  (PPM C)       69.60            21.16            32.71
CO  (PPM)        150.21             3.95            13.83
CO2 (%)            2.92             1.81             2.53

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.70             1.38             2.06
HC                 2.30             1.20             1.08
CO                10.02             0.45             0.92
CO2             3079.91          3262.16          2660.30

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.55
HC                 0.37
CO                 0.70
CO2              813.72

FUEL ECONOMY  (MILES/GAL)

EPAMPG            10.90
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Telex western union

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                     ****** CVS 717 ******

                    *** IDENTIFICATION ***

TEST DATE: 12-3-75                 ROAD TEST: NA
VEHICLE:  ETV 24                   DRIVER: MIKE E
MATERIAL: GEM 68-0B/0F             TEST MILES: 1984

COMMENTS:          CHOKE PULLED OFF @ 120 SEC. INTO TEST
                   NOTHING ELSE CHANGE FROM TEST 714    10.99 MPG.

                        *** TEST DATA ***

TEMP: 57   F (WET)                 PRES: 752.485  MM HG (BARO)
      78   F (DRY)                       24.617  MM HG (VAPOR)
      102  F (MIX)                       25.9   IN. H20 (INLET)
RH:  24  %                               18.9   IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3010
BLOWER RPM (ACT): 928.505          BLOWER RPM (CAL): 928.481

                     BAG 1             BAG 2             BAG 3
                  AIR     EX        AIR     EX        AIR      EX

TIME (SECS)          513.4              864.4            504
BLOWER REVS          7945               13376            7800
CO  (PPM)        4.70   165.00     12.00    15.00     5.90    17.00
HC  (PPM C)      6.32    75.20      7.52    28.36     6.96    35.64
NOX (PPM)        0.53    42.80      0.83     9.80     0.57    21.20
CO2 (%)          0.04     2.72      0.04     1.64     0.04     2.36

                    *** CALCULATED RESULTS ***

                  BAG 1            BAG 2             BAG 3

VMIX (CF)         2081.67          3504.64           2043.68
DF                4.88511          8.14948           5.66555

CORRECTED CONCENTRATIONS

NOX (PPM)           42.38             9.07             20.73
HC  (PPM C)         70.17            21.76             29.91
CO  (PPM)          151.37             3.96             11.27
CO2 (%)              2.69             1.60              2.33

MASS EMISSIONS  (GRAMS/BAG)

NOX                  4.01             1.45              1.93
HC                   2.39             1.25              1.00
CO                  10.39             0.46              0.76
CO2               2918.27          2933.25           2480.13

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.57
HC                   0.38
CO                   0.71
CO2                746.90

FUEL ECONOMY  (MILES/GAL)

EPAMPG              11.78
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Telex western union

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                    ****** CVS 71J * ****

                    *** IDENTIFICATION ***

TEST DATE: 12-5-75              ROAD TEST: VA
VEHICLE:  ETV 24                DRIVER: LARRY
MATERIAL: GEM 53-08/0F          TEST MILES: 2023

COMMENTS:        ONLY CHANGE FROM PREVIOUS TEST IS NO VAC. ADJ. FIRST
N.
                 (CONN. TO PORT AIR TIMMER)  10.84 MPG.

                       *** TEST DATA ***

TEMP: 60  F (WET)               PRES: 748.735  MM HG (BARO)
      80  F (DRY)                     25.271  MM HG (VAPOR)
      102  F (MIX)                    24.2375  IN. H2O (INLET)
RH:  29  %                            18.9  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2990
BLOWER RPM (ACT): 928.464       BLOWER RPM (CAL): 928.649

                    BAG 1            BAG 2            BAG 3
                  AIR    EX       AIR    EX        AIR    EX

TIME (SECS)         507.4            869              504.9
BLOWER REVS         7852            13446             7814
CO   (PPM)       8.30  125.00   67.00   57.00   17.00   29.00
HC   (PPM C)     3.72   53.20   12.96   31.96    9.44   39.52
NOX  (PPM)       0.61   25.50    0.92    9.54    0.42   21.30
CO2  (%)         0.04    3.06    0.04    1.78    0.04    2.50

                 *** CALCULATED RESULTS * *

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2041.51          3495.95          2031.63
DF               4.35494          7.49169          5.34571

CORRECTED CONCENTRATIONS

NOX (PPM)          25.03             8.74            20.96
HC  (PPM C)        46.48            20.73            31.85
CO  (PPM)         110.13            -3.00            13.64
CO2 (%)             3.03             1.75             2.47

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.42             1.45             2.02
HC                  1.55             1.18             1.06
CO                  7.41            -0.35             0.91
CO2              3225.02          3181.99          2614.29

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.49
HC                  0.33
CO                  0.45
CO2               807.85

FUEL ECONOMY  (MILES/GAL)

EPAMPG             10.39
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                 ****** CVS 720 ******

                 *** IDENTIFICATION ***

TEST DATE: 12-8-75               ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: LARRY
MATERIAL:  GEM 68-OB/OF          TEST MILES: 2050

COMMENTS:       HARD STARTING 1ST AND 2ND BAGS   11.22MPG.
                GM EXP. EGR  .302 ORFICE STIFF SPRING

                    *** TEST DATA ***

TEMP: 56   F (WET)               PRES: 748.835  MM HG (BARO)
      77   F (DRY)                     23.756  MM HG (VAPOR)
      105  F (MIX)                     24.325  IN. H2O (INLET)
RH:  23  %                             19.075  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2993
BLOWER RPM (ACT): 928.567        BLOWER RPM (CAL): 928.622

                     BAG 1           BAG 2           BAG 3
                  AIR     EX      AIR     EX      AIR     EX

TIME (SECS)          505.4           876.8            506
BLOWER REVS          7821            13570            7831
CO  (PPM)        12.00  325.00   15.00   23.00   12.00   61.00
HC  (PPM C)       6.92  175.20    8.36   29.16    7.64  272.40
NOX (PPM)         0.19   37.40    0.73   14.20    0.52   40.30
CO2 (%)           0.04    2.94    0.04    1.60    0.04    2.40

                 *** CALCULATED RESULTS ***

                 BAG 1           BAG 2           BAG 3

VMIX (CF)        2024.76         3513.1          2027.35
DF               4.4847          8.34824         5.50757

CORRECTED CONCENTRATIONS

NOX (PPM)         37.25           13.56           39.87
HC  (PPM C)      169.82           21.80          266.15
CO  (PPM)        294.94            9.02           47.98
CO2 (%)            2.91            1.56            2.37

MASS EMISSIONS  (G RAMS/BAG)

NOX                3.40            2.15            3.64
HC                 5.6 2            1.25            8.81
CO                19.69            1.04            3.21
CO2             307 1.56         2866.83         2502.81

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.76
HC                1.16
CO                1.51
CO2             7 48.56

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.55
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                 ****** CVS 722 ******

                 *** IDENTIFICATION ***

TEST DATE: 12-9-75              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: LARRY
MATERIAL:  GEM 68-0B/0F         TEST MILES: 1222

COMMENTS:       AS OF  12-9-75 CORRECT CATALYST MILEAGE ON ETV 24 IS 1222
                11.22 MPG.

                   *** TEST DATA ***

TEMP: 59   F (WET)              PRES: 739.385  MM HG (BARO)
      77   F (DRY)                     23.758  MM HG (VAPOR)
      102  F (MIX)                     23.975  IN. H20 (INLET)
RH:  32  %                             18.8125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2992
BLOWER RPM (ACT): 928.472       BLOWER RPM (CAL): 928.684

                    BAG 1          BAG 2          BAG 3
                  AIR    EX      AIR    EX      AIR    EX

TIME (SECS)         505            868.5          505.2
BLOWER REVS         7815           13440          7817
CO  (PPM)       14.00  200.00  16.00   19.00   9.70   22.00
HC  (PPM C)      9.24  105.20  10.12   30.20   9.28   43.60
NOX (PPM)        0.42   34.70   0.55   14.50   0.41   40.50
CO2 (%)          0.04    2.96   0.04    1.66   0.04    2.40

                *** CALCULATED RESULTS ***

                BAG 1          BAG 2          BAG 3

VMIX (CF)       2007.92        3453.16        2008.43
DF              4.48284        8.04882        5.5684

CORRECTED CONCENTRATIONS

NOX (PPM)         34.37          14.02          40.16
HC  (PPM C)       98.02          21.34          35.99
CO  (PPM)        175.77           4.33          12.88
CO2 (%)            2.93           1.62           2.37

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.28           2.30           3.83
HC                 3.21           1.20           1.18
CO                11.64           0.49           0.85
CO2             3066.96        2926.28        2479.38

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.79
HC                 0.43
CO                 0.80
CO2              754.44

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.57
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                          ****** CVS 724 ******

                         *** IDENTIFICATION ***

TEST DATE: 12-10-75                ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: LARRY
MATERIAL:  GEM 68-OB/OF            TEST MILES: 1229

COMMENTS:          1 STALL 1ST BAG
                   REPEAT OF TESTM # 722        11.26 MPG.

                            *** TEST DATA ***

TEMP: 58   F (WET)                 PRES: 741.885  MM HG (BARO)
      78   F (DRY)                       24.617  MM HG (VAPOR)
      102  F (MIX)                       24.4125  IN. H20 (INLET)
RH:  27  %                               19.1625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3001
BLOWER RPM (ACT): 928.511          BLOWER RPM (CAL): 928.605

                       BAG 1          BAG 2          BAG 3
                     AIR    EX      AIR    EX      AIR    EX

TIME (SECS)            506            868.2          506.1
BLOWER REVS            7830           13436          7832
CO  (PPM)           6.70  347.00   15.00   20.00   16.00   28.00
HC  (PPM C)         6.76  181.20    9.92   31.12    9.96   45.20
NOX (PPM)           0.28   39.40    0.37   14.40    0.36   40.60
CO2 (%)             0.04    2.90    0.04    1.62    0.04    2.40

                       *** CALCULATED RESULTS ***

                    BAG 1          BAG 2          BAG 3

VMIX (CF)           2022.52        3470.58        2023.04
DF                  4.54148        8.24599        5.56671

CORRECTED CONCENTRATIONS

NOX (PPM)            39.18          14.07          40.30
HC  (PPM C)         175.93          22.40          37.03
CO  (PPM)           319.42           6.14          13.45
CO2 (%)               2.87           1.58           2.37

MASS EMISSIONS  (G RAMS/BAG)

NOX                   3.68           2.27           3.78
HC                    5.81           1.27           1.22
CO                   21.30           0.70           0.90
CO2                3025.86        2868.43        2497.42

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.80
HC                    0.60
CO                    1.38
CO2                 745.74

FUEL ECONOMY  (MILES/GAL)

EPAMPG               11.65
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                    ****** CVS 726 ******

                   *** IDENTIFICATION ***

TEST DATE: 12-11-75            ROAD TEST: VA
VEHICLE:   ETV 24              DRIVER: MIKE E
MATERIAL:  GEM 68-OB/OF        TEST MILES: 1240

COMMENTS:       CHOKE RICHER BY .025 (FRONT VAC. BRAKE) 3RD BAG HARD STAR
TING
                NO  OTHER CHANGES EGR ON IN 1 MIN. 25 SEC. COLD START 109
5 MPG.

                     *** TEST DATA ***

TEMP: 56   F (WET)             PRES: 748.885  MM HG (BARO)
      74   F (DRY)                    21.453  MM HG (VAPOR)
      100  F (MIX)                    24.675  IN. H20 (INLET)
RH:   33  %                           19.25  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3000
BLOWER RPM (ACT): 928.504      BLOWER RPM (CAL): 928.569

                     BAG  1           BAG  2           BAG  3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          503.8            869.4            504.4
BLOWER REVS          7796             13455            7805
CO  (PPM)        19.00  853.00    24.00    26.00   29.00    92.00
HC  (PPM C)       8.24   90.00     9.40    30.84   10.24   680.80
NOX (PPM)         0.55   22.20     0.50    14.40    0.71    36.90
CO2 (%)           0.04    3.04     0.04     1.64    0.08     2.36

                  *** CALCULATED RESULTS ***

                 BAG  1          BAG  2          BAG  3

VMIX (CF)        2039.37         3519.73         2041.73
DF               4.28334         8.14305         5.4991

CORRECTED CONCENTRATIONS

NOX (PPM)          21.78           13.96           36.32
HC  (PPM C)        83.68           22.59          672.42
CO  (PPM)         779.58            4.07           63.37
CO2 (%)             3.01            1.60            2.29

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.08            2.30            3.47
HC                  2.79            1.30           22.42
CO                 52.42            0.47            4.27
CO2              3200.53         2945.88         2443.15

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.69
HC                  2.04
CO                  3.39
CO2               761.96

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.24
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                    ****** CVS 730 ******

                    *** IDENTIFICATION ***

TEST DATE: 12-12-75           . ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: LARRY
MATERIAL:  GEM 680B/OF          TEST MILES: 1251

COMMENTS:        REPEAT TEST - EGR VALVE 1220-STIFF SPRING
                 VERY GOOD COLD & HOT START 3918CC=10.72

                      *** TEST DATA ***

TEMP: 59   F (WET)              PRES: 752.385  MM HG (BARO)
      76   F (DRY)                    22.922  MM HG (VAPOR)
      100  F (MIX)                    24.9375  IN. H20 (INLET)
RH:  34  %                            19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3003
BLOWER RPM (ACT): 927.827       BLOWER RPM (CAL): 928.525

                    BAG 1             BAG 2            BAG 3
                 AIR     EX        AIR     EX       AIR     EX

TIME (SECS)         503.9             868.5            506.7
BLOWER REVS         7797              13437            7824
CO  (PPM)       10.70   440.00    16.70   19.10   10.70   22.40
HC  (PPM C)     9.16    87.56     9.88    30.92   8.80    42.32
NOX (PPM)       0.56    25.80     0.61    10.96   0.44    25.81
CO2 (%)         0.03    2.88      0.06    1.71    0.03    2.37

                  *** CALCULATED RESULTS ***

                BAG 1             BAG 2             BAG 3

VMIX (CF)       2050.51           3533.76           2057.61
DF              4.57364           7.81378           5.63891

CORRECTED CONCENTRATIONS

NOX (PPM)        25.36             10.43             25.45
HC  (PPM C)      80.40             22.30             35.08
CO  (PPM)       402.51              3.86             12.43
CO2 (%)           2.86              1.66              2.35

MASS EMISSIONS  (GRAMS/BAG)

NOX                2.47              1.75              2.49
HC                 2.69              1.29              1.18
CO                27.21              0.45              0.84
CO2             3054.64           3054.87           2516.64

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.56
HC                 0.42
CO                 1.68
CO2              773.71

FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 731 ******

                    *** IDENTIFICATION ***

   TEST DATE: 12-15-75            ROAD TEST: NA
   VEHICLE:   ETV 24              DRIVER: LARRY
   MATERIAL:  GEM 68 OB/OF        TEST MILES: 1264

   COMMENTS:        REPEAT OF LAST TEST - NO CHANGES    •421 ORIFICE
                    NOT RUN FOR 2 DAYS BEFORE THIS TEST  3928 CC = 10.69 MPG

                       *** TEST DATA ***

   TEMP: 64  F (WET)              PRES: 741.885  MM HG (BARO)
         79  F (DRY)                    25.509  MM HG (VAPOR)
        102  F (MIX)                    24.675  IN. H2O (INLET)
   RH:  43  %                           19.1625  IN. H2O (OUTLET)
   INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
   FUEL: HO III                   CF/REV: .3005
   BLOWER RPM (ACT): 928.472      BLOWER RPM (CAL): 928.578

                          BAG 1          BAG 2          BAG 3
                        AIR    EX      AIR    EX      AIR    EX

   TIME (SECS)            504.9          868.6          505.2
   BLOWER REVS            7813           13441          7818
   CO  (PPM)           9.70  508.00  11.00   17.40  19.80   38.20
   HC  (PPM C)         8.56  105.20   9.12   29.60   8.88   48.80
   NOX (PPM)           0.86   24.30   0.13   10.60   0.26   25.20
   CO2 (%)             0.04    2.94   0.04    1.72   0.04    2.46

                    *** CALCULATED RESULTS ***

                      BAG 1          BAG 2          BAG 3

   VMIX (CF)          2019.2         3473.71        2020.49
   DF                 4.47003        7.76984        5.42847

   CORRECTED CONCENTRATIONS

   NOX (PPM)           23.63          10.49          24.99
   HC  (PPM C)         98.55          21.65          41.56
   CO  (PPM)          464.77           7.13          19.93
   CO2 (%)              2.91           1.69           2.43

   MASS EMISSIONS  (GRAMS/BAG)

   NOX                  2.47           1.89           2.61
   HC                   3.25           1.23           1.37
   CO                  30.94           0.82           1.33
   CO2               3063.16        3052.71        2557.69

   WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

   NOX                  0.59
   HC                   0.45
   CO                   1.98
   CO2                777.03

   FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 738 ******

                   *** IDENTIFICATION ***

TEST DATE: 12-16-75              ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: LARRY
MATERIAL: GEM 68-OB/CF           TEST MILES: 1275

COMMENTS:        .302 ORIFICE    VALVE # 1220 (B)
                 NO  OTHER CHANGES  11.37 MPG.

                     *** TEST DATA ***

TEMP: 59   F (WET)               PRES: 746.785  MM HG (BARO)
      80   F (DRY)                      26.271  MM HG (VAPOR)
      100  F (MIX)                      24.675  IN. H20 (INLET)
RH:  26  %                              19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3004
BLOWER RPM (ACT): 928.471        BLOWER RPM (CAL): 928.552

                      BAG 1             BAG 2             BAG 3
                   AIR     EX        AIR     EX        AIR     EX

TIME (SECS)          506.5             868.1             505.2
BLOWER REVS          7838              13433             7818
CO  (PPM)         13.20  495.00    20.80    20.20   10.60    23.80
HC  (PPM C)        8.00   88.00     8.68    30.52    7.60    39.04
NOX (PPM)          0.41   41.70     0.66    25.00    0.41    68.40
CO2 (%)            0.04    2.72     0.06     1.60    0.04     2.28

                  *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)         2046.84          3507.94          2041.62
DF                4.82832          8.34895          5.86136

CORRECTED CONCENTRATIONS

NOX (PPM)           41.37            24.42            68.06
HC  (PPM C)         81.66            22.88            32.74
CO  (PPM)          454.55             1.25            13.84
CO2 (%)              2.69             1.55             2.25

MASS EMISSIONS  (GRAMS/BAG)

NOX                  3.94             3.99             6.47
HC                   2.73             1.31             1.09
CO                  30.67             0.14             0.93
CO2               2869.55          2830.41          2392.21

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  1.25
HC                   0.41
CO                   1.85
CO2                723.72

FUEL ECONOMY  (MILES/GAL)

EPAMPG              12.07
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                    ****** CVS 741 ******

                   *** IDENTIFICATION ***

TEST DATE: 12/17/75              ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: LARRY
MATERIAL:  GEM 68 0 B/OF          TEST MILES: 1290

COMMENTS:         REPEAT OF PREVIOUS TEST
                  WEIGHTED FUEL-3744CC  11.2MPG

                     *** TEST DATA ***

TEMP: 56   F (WET)               PRES: 746.685  MM HG (BARO)
      75   F (DRY)                     22.243  MM HG (VAPOR)
     100   F (MIX)                     24.5875  IN. H20 (INLET)
RH:  27  %                             19.3375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3002
BLOWER RPM (ACT): 928.385        BLOWER RPM (CAL): 928.569

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)         504.7            867.9            505.5
BLOWER REVS         7810             13429            7821
CO  (PPM)       13.00  333.00   17.00   20.00   10.00   24.00
HC  (PPM C)      6.16   44.12    8.88   29.60    6.20   29.00
NOX (PPM)        0.53   22.50    0.47   13.60    0.43   37.52
CO2 (%)          0.06    2.51    0.07    1.68    0.05    2.42

                  *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)        2038.19          3504.59          2041.06
DF               5.26355          7.9531           5.52539

CORRECTED CONCENTRATIONS

NOX (PPM)          22.07            13.19            37.17
HC  (PPM C)        39.13            21.84            23.92
CO  (PPM)         303.57             4.45            14.55
CO2 (%)             2.46             1.62             2.38

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.05             2.11             3.46
HC                  1.30             1.25             0.80
CO                 20.40             0.51             0.98
CO2              2616.26          2958.60          2532.29

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.66
HC                  0.30
CO                  1.31
CO2               736.93

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.08
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                    ****** CVS 742 ******

                    *** IDENTIFICATION ***

TEST DATE: 12/18/75               ROAD TEST: VA
VEHICLE:  ETV 24                  DRIVER: LARRY
MATERIAL: GEM 68 OB/OF            TEST MILES: 1311

COMMENTS:        NO  CHANGES
                 WEIGHTED FUEL-3737CC  11.2MPG

                      *** TEST DATA ***

TEMP: 54  F (WET)                 PRES: 748.485  MM HG (BARO)
      73  F (DRY)                       20.815  MM HG (VAPOR)
      100  F (MIX)                      25.2  IN. H20 (INLET)
RH:  25  %                              19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3010
BLOWER RPM (ACT): 928.416         BLOWER RPM (CAL): 928.499

                    BAG 1             BAG 2             BAG 3
                 AIR     EX        AIR     EX        AIR      EX

TIME (SECS)         506.3             868.6             505.4
BLOWER REVS         7834              13440             7821
CO  (PPM)      26.00  486.00   28.00    30.00   52.00    53.00
HC  (PPM C)     9.28   64.00   13.20    32.24   16.96    50.80
NOX (PPM)       0.73   29.40    0.85    14.10    0.45    41.80
CO2 (%)         0.06    2.78    0.06     1.69    0.06     2.40

                  *** CALCULATED RESULTS ***

                 BAG 1             BAG 2             BAG 3

VMIX (CF)        2051.99           3520.39           2048.58
DF               4.73163           7.90047           5.55995

CORRECTED CONCENTRATIONS

NOX (PPM)          28.82             13.36             41.43
HC  (PPM C)        56.68             20.71             36.89
CO  (PPM)         435.73              4.52              7.82
CO2 (%)             2.73              1.64              2.35

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.65              2.11              3.80
HC                  1.90              1.19              1.23
CO                 29.48              0.53              0.53
CO2              2924.27           3006.43           2511.44

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.72
HC                  0.36
CO                  1.80
CO2               759.39

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.58
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                      ****** CVS 747 ******

                    *** IDENTIFICATION ***

 TEST DATE: 1-6-76                   ROAD TEST: NA
 VEHICLE:   ETV 24                   DRIVER: LARRY
 MATERIAL: GEM 68-0B/0F              TEST MILES: 1356

 COMMENTS:         1 ST TEST AFTER 18 DAYS OF SETTIMG
  ,                SAME AS TEST 742     11.20 MPG.

                       *** TEST DATA ***

 TEMP: 53   F (WET)                  PRES: 749.335  MM HG (BARO)
       75   F (DRY)                         22.243  MM HG (VAPOR)
       100  F (MIX)                         25.2875  IN. H20 (INLET)
 RH:   18   %                               20.0375  IN. H20 (OUTLET)
 INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
 FUEL: HO III                        CF/REV: .3018
 BLOWER RPM (ACT): 929.032           BLOWER RPM (CAL): 928.428

                     BAG 1            BAG 2            BAG 3
                   AIR    EX        AIR    EX        AIR    EX

 TIME (SECS)         506.5            867.1             505
 BLOWER REVS         7839             13429             7820
 CO  (PPM)        11.00  655.00    9.80   11.00    3.30   19.00
 HC  (PPM C)       8.56  104.80    8.32   30.00    7.80   38.72
 NOX (PPM)         0.74   35.30    0.62   14.30    0.68   41.40
 CO2 (%)           0.04    2.76    0.04    1.68    0.05    2.38

                  *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

 VMIX (CF)       2060.85          3530.45          2055.86
 DF              4.73144          7.95697          5.61686

 CORRECTED CONCENTRATIONS

 NOX (PPM)         34.72            13.76            40.84
 HC  (PPM C)       98.05            22.73            32.31
 CO  (PPM)        607.77             2.06            15.32
 CO2 (%)            2.73             1.65             2.34

 MASS EMISSIONS  (GRAMS/BAG)

 NOX                3.12             2.12             3.66
 HC                 3.30             1.31             1.08
 CO                41.30             0.24             1.04
 CO2             2932.37          3028.71          2507.61

 WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

 NOX                0.74
 HC                 0.45
 CO                 2.48
 CO2              762.53

 FUEL ECONOMY  (MILES/GAL)

 EPAMPG            11.52
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                    ****** [illegible] ******

                    *** IDENTIFICATION ***

TEST DATE: 1-7-76               2000 TEST: NO
VEHICLE:  EIV 24                DRIVER: [illegible]
MATERIAL: GE4 53-08.07          TEST MILES: 1355

COMMENTS:        DUAL DIAPHRAGM EGR VALVE
                 NO OTHER VEHICLE CHANGES  3302 CC = 10.79 [illegible]

                      *** TEST DATA ***

TEMP: 57  F (WET)               PRESS: 744.155  MM HG (BARO)
      74  F (DRY)                      21.453  MM HG (VAPOR)
      104  F (MIX)                     24.575  IN. H2O (INLET)
RH:  33  %                             19.5125  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3007
BLOWER RPM (ACT): 923.422       BLOWER RPM (CAL): 928.543

                    BAG 1            BAG 2             BAG 3
                  AIR     EX       AIR     EX        AIR     EX

TIME (SECS)         505             863.2             505.6
BLOWER REVS         7314            13435             7323
CO  (PPM)         1.00  542.00    1.00     9.00    1.00     5.00
HC  (PPM C)       8.24   97.20    8.88    31.56    8.32    60.80
NOX (PPM)         0.75   23.00    0.59     9.26    0.64    22.10
CO2 (%)           0.04    3.01    0.04     1.78    0.04     2.46

                 *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2020.69          3474.28          2023.02
DF               4.36453          7.51115          5.43269

CORRECTED CONCENTRATIONS

NOX (PPM)         22.42             8.75            21.53
HC  (PPM C)       90.85            23.86            54.01
CO  (PPM)        504.06             7.74          .  3.90
CO2 (%)            2.98             1.75             2.43

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.12             1.42             2.04
HC                  3.00             1.35             1.78
CO                 33.58             0.89             0.26
CO2              3139.42          3162.24          2560.88

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.47
HC                  0.49
CO                  2.06
CO2               796.25

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.02
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177<

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                    ****** CVS 752 ******

                    *** IDENTIFICATION ***

TEST DATE: 1-8-76               ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: LARRY
MATERIAL: GEM 680B/OF           TEST MILES: 1379

COMMENTS:       STOCK AIR PUMP - EXP EGR VALVE -  STIFF
                SPRING - 302 ORIFICE       3676CC = 11.43 MPG

                      *** TEST DATA ***

TEMP: 54   F (WET)              PRES: 748.385  MM HG (BARO)
      76   F (DRY)                    22.922  MM HG (VAPOR)
      102  F (MIX)                    24.85  IN. H20 (INLET)
RH:  19  %                            19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3010
BLOWER RPM (ACT): 928.411       BLOWER RPM (CAL): 928.499

                  BAG 1           BAG 2           BAG 3
               AIR     EX      AIR     EX      AIR     EX

TIME (SECS)       505.5           868.1           504.9
BLOWER REVS       7822            13432           7813
CO  (PPM)      1.00  639.00    6.00    7.00   11.00   12.00
HC  (PPM C)    8.60  100.60    9.84   28.48    9.28   37.08
NOX (PPM)      0.64   36.25    0.70   13.86    0.66   45.42
CO2 (%)        0.05    2.85    0.06    1.65    0.07    2.37

                  *** CALCULATED RESULTS ***

               BAG 1           BAG 2           BAG 3

VMIX (CF)      2042.87         3508.03         2040.52
DF             4.58894         8.10392         5.64247

CORRECTED CONCENTRATIONS

NOX (PPM)       35.75           13.25           44.88
HC  (PPM C)     93.87           19.85           29.44
CO  (PPM)      599.24            1.51            2.38
CO2 (%)          2.81            1.60            2.31

MASS EMISSIONS  (GRAMS/BAG)

NOX              3.21            2.04            4.02
HC               3.13            1.14            0.98
CO              40.36            0.17            0.16
CO2           2994.61         2922.35         2460.70

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX              0.76
HC               0.41
CO               2.35
CO2            748.35

FUEL ECONOMY  (MILES/GAL)
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178<

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                ****** CVS 754 ******

                 *** IDENTIFICATION ***

TEST DATE: 1-9-76                ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: LARRY
MATERIAL: GEM 680B/OF            TEST MILES: 1391

COMMENTS:       LEANED OUT CHOKE .030
                STOCK AIR PUMP  3577CC - 11.74 MPG

                  *** TEST DATA ***

TEMP: 53   F (WET)               PRES: 751.335  MM HG (BARO)
      75   F (DRY)                      22.243  MM HG (VAPOR)
      102  F (MIX)                      24.7625  IN. H20 (INLET)
RH:  18  %                              19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3006
BLOWER RPM (ACT): 923.444        BLOWER RPM (CAL): 928.508

                    BAG 1          BAG 2          BAG 3
                  AIR    EX      AIR    EX      AIR    EX

TIME (SECS)         503.8          868.7          504.9
BLOWER REVS         7796           13444          7811
CO  (PPM)        18.90  439.00  13.90   14.90   9.40   10.00
HC  (PPM C)       8.28   86.40   7.96   27.28   7.32   35.92
NOX (PPM)         0.82   43.90   0.55   14.90   0.46   46.40
CO2 (%)           0.05    2.72   0.04    1.58   0.04    2.32

               *** CALCULATED RESULTS ***

                  BAG 1          BAG 2          BAG 3

VMIX (CF)        2042.72        3522.62        2046.65
DF               4.83757        8.45872        5.76458

CORRECTED CONCENTRATIONS

NOX (PPM)          43.25          14.42          46.02
HC  (PPM C)        79.83          20.26          29.37
CO  (PPM)         398.56           2.17           1.77
CO2 (%)             2.68           1.54           2.29

MASS EMISSIONS  (G RAMS/BAG)

NOX                 3.85           2.21           4.10
HC                  2.66           1.17           1.00
CO                 26.84           0.25           0.12
CO2              2855.31        2837.74        2440.92

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.83
HC                  0.38
CO                  1.58
CO2               7 27.58

FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 755 ******

                   *** IDENTIFICATION ***

TEST DATE: 1-12-76                 ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: MIKE E
MATERIAL: GEM 68-0B/0F              TEST MILES: 1432

COMMENTS:         CHOKE LEANED OUT .015 MORE THEN LAST TEST
                  GOOD START BAG 1 & 3  3615 CC = 11.62 MPG.

                      *** TEST DATA ***

TEMP: 56   F (WET)                 PRES: 750.685  MM HG (BARO)
      78   F (DRY)                        24.617  MM HG (VAPOR)
      105  F (MIX)                        25.025  IN. H20 (INLET)
RH:  21  %                                19.95  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3012
BLOWER RPM (ACT): 928.497          BLOWER RPM (CAL): 928.464

                     BAG 1            BAG 2            BAG 3
                   AIR    EX        AIR    EX        AIR    EX

TIME (SECS)          504.5            868.4             503.1
BLOWER REVS          7808             13439             7784
CO  (PPM)         3.70  215.00     2.40     3.00     4.50     5.00
HC  (PPM C)       7.12   72.80     7.60    25.64     7.20    34.08
NOX (PPM)         0.45   39.80     0.66    14.40     0.44    43.70
CO2 (%)           0.04    2.78     0.05     1.60     0.04     2.31

                  *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2035.98          3504.29          2029.72
DF               4.77296          8.36009          5.79113

CORRECTED CONCENTRATIONS

NOX (PPM)          39.44            13.82            43.34
HC  (PPM C)        67.17            18.95            28.12
CO  (PPM)         199.13             0.79             1.05
CO2 (%)             2.75             1.56             2.28

MASS EMISSIONS  (GRAMS/BAG)

NOX                 3.59             2.17             3.93
HC                  2.23             1.08             0.93
CO                 13.37             0.09             0.07
CO2              2918.13          2843.54          2410.10

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.79
HC                  0.34
CO                  0.78
CO2               729.61

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.00
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                    ****** CVS 756 ******

                   *** IDENTIFICATION ***

TEST DATE: 1-13-76               ROAD TEST: NA
VEHICLE:  ETV 24                 DRIVER: MIKE K
MATERIAL: GEM 68-OB/OF           TEST MILES: 1465

COMMENTS:       2ND TEST ( BASELINE CATALYST )
                NO VEHICLE CHANGES  3608 CC = 11.64 MPH

                     *** TEST DATA ***

TEMP: 56  F (WET)                PRES: 743.585  MM HG (BARO)
      78  F (DRY)                      24.617  MM HG (VAPOR)
     101  F (MIX)                      24.675  IN. H2O (INLET)
RH:  21  %                             19.6  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3009
BLOWER RPM (ACT): 928.508        BLOWER RPM (CAL): 928.534

                    BAG 1          BAG 2          BAG 3
                  AIR    EX      AIR    EX      AIR    EX

TIME (SECS)         506           868.3          506.2
BLOWER REVS         7831          13436          7834
CO  (PPM)        1.00  192.00   3.00    4.00   2.30    3.00
HC  (PPM C)      9.84   74.00  10.08   29.00   9.40   37.76
NOX (PPM)        0.42   40.10   0.57   14.20   0.47   45.80
CO2 (%)          0.04    2.80   0.04    1.61   0.04    2.36

                 *** CALCULATED RESULTS ***

                BAG 1          BAG 2          BAG 3

VMIX (CF)       2035.23        3491.93        2036.01
DF              4.74263        8.30603        5.66821

CORRECTED CONCENTRATIONS

NOX (PPM)         39.77          13.70          45.41
HC  (PPM C)       66.23          20.13          30.02
CO  (PPM)        179.57           1.23           0.96
CO2 (%)            2.77           1.57           2.33

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.62           2.14           4.14
HC                 2.20           1.15           1.00
CO                12.05           0.14           0.06
CO2             2938.34        2867.81        2470.82

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.81
HC                 0.36
CO                 0.71
CO2              738.62

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.85
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                    ****** CVS 760 ******

                    *** IDENTIFICATION ***

TEST DATE: 1-15-76                 ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: MIKE E
MATERIAL:  GEM 68 OB/OF            TEST MILES: 1522

COMMENTS:        3 RD CATALYST BASELINE TEST - VEHICLE WILLNOW
                 BE TAKEN TO EPA IN MICH.   3600 CC = 11.67 MPG

                       *** TEST DATA ***

TEMP: 55   F (WET)                 PRES: 752.985  MM HG (BARO)
      75   F (DRY)                       22.243  MM HG (VAPOR)
      98   F (MIX)                       25.025  IN. H20 (INLET)
RH:  24  %                               19.8625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3010
BLOWER RPM (ACT): 928.369          BLOWER RPM (CAL): 928.472

                        BAG 1            BAG 2            BAG 3
                     AIR     EX       AIR     EX       AIR     EX

TIME (SECS)            504.1            867.4            504.5
BLOWER REVS            7799             13422            7806
CO   (PPM)         4.50   235.00    6.30     7.50    2.40     3.40
HC   (PPM C)      19.84    94.28   21.16    39.36   23.04    52.92
NOX  (PPM)         0.67    44.36    0.71    15.40    0.60    44.91
CO2  (%)           0.05     2.75    0.06     1.61    0.05     2.31

                   *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)         2063.9           3551.95          2065.75
DF                4.81754          8.29898          5.7868

CORRECTED CONCENTRATIONS

NOX (PPM)          43.83            14.78            44.41
HC   (PPM C)       78.56            20.75            33.86
CO   (PPM)        217.20             1.71             1.25
CO2 (%)             2.71             1.56             2.27

MASS EMISSIONS   (GRAMS/BAG)

NOX                 4.06             2.36             4.12
HC                  2.65             1.20             1.14
CO                 14.78             0.20             0.09
CO2              2917.25          2884.52          2443.98

WEIGHTED MASS EMISSIONS   (GRAMS/MILE)

NOX                 0.86
HC                  0.40
CO                  0.88
CO2               737.60

FUEL ECONOMY   (MILES/GAL)

EPAMPG             11.89
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                    ****** CVS 782 ******

                   *** IDENTIFICATION ***

TEST DATE: 2-6-76              ROAD TEST: NA
VEHICLE:  ETV 24               DRIVER: MIKE K
MATERIAL: GEM 68-03/OF         TEST MILES: 1916

COMMENTS:         FIRST TEST USING ELECTRIC CHOKE  TOO LEAN 1 STALL
                  DUAL DIAPHRAGM EGR  SSHCROFT VALVE  3735 CC = 11.24 MPG.

                     *** TEST DATA ***

TEMP: 52  F (WET)              PRES: 748.935  MM HG (BARO)
      72  F (DRY)                    20.07  MM HG (VAPOR)
     100  F (MIX)                    24.7625  IN. H20 (INLET)
RH:  21  %                           19.5125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3005
BLOWER RPM (ACT): 928.598      BLOWER RPM (CAL): 928.534

                      BAG 1          BAG 2          BAG 3
                   AIR    EX      AIR    EX       AIR    EX

TIME (SECS)          505.6          868.2          506.1
BLOWER REVS          7840           13436          7834
CO  (PPM)         1.00  180.00   3.00    4.00   1.00    2.00
HC  (PPM C)      10.12   94.40  11.08   31.83  11.88   46.80
NOX (PPM)         0.69   46.40   0.76    8.42   0.57   27.90
CO2 (%)           0.04    2.80   0.05    1.72   0.04    2.41

                 *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)        2053.61        3519.43        2052.04
DF               4.7411         7.77455        5.54395

CORRECTED CONCENTRATIONS

NOX (PPM)          45.86           7.76          27.43
HC  (PPM C)        85.41          22.23          37.06
CO  (PPM)         168.29           1.24           1.08
CO2 (%)             2.77           1.68           2.38

MASS EMISSIONS  (GRAMS/BAG)

NOX                 4.12           1.20           2.46
HC                  2.90           1.28           1.24
CO                 11.39           0.14           0.07
CO2              2964.88        3076.89        2543.94

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.58
HC                  0.43
CO                  0.68
CO2               773.58

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.43
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                    ****** CVS 735 ******

                    *** IDENTIFICATION ***

TEST DATE: 2-9-76                ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: MIKE K
MATERIAL: GEM 68-0B/0F           TEST MILES: 1928

COMMENTS:        SECOND TEST WITH ELECTRIC CHOKE
                 CHOKE IS NOT SET UP RIGHT YET    11.04 MPG.

                      *** TEST DATA ***

TEMP: 54   F (WET)               PRES: 746.585  MM HG (BARO)
      75   F (DRY)                     22.243  MM HG (VAPOR)
      100   F (MIX)                    24.7625  IN. H20 (INLET)
RH:  21  %                             19.5125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3006
BLOWER RPM (ACT): 928.578        BLOWER RPM (CAL): 928.534

                       BAG 1           BAG 2          BAG 3
                     AIR    EX       AIR    EX      AIR    EX

TIME (SECS)           506.4           867.9          505.8
BLOWER REVS           7837            13432          7828
CO  (PPM)          1.00  345.00    2.60    3.00   1.00    2.00
HC  (PPM C)       22.52  120.00   22.84   44.40  28.60   66.80
NOX (PPM)          0.43   34.50    0.70    9.60   0.55   22.60
CO2 (%)            0.04    2.86    0.04    1.76   0.05    2.42

                   *** CALCULATED RESULTS ***

                    BAG 1           BAG 2          BAG 3

VMIX (CF)          2047.21         3508.75        2044.86
DF                 4.61374         7.59324        5.52152

CORRECTED CONCENTRATIONS

NOX (PPM)            34.16            8.99          22.15
HC  (PPM C)         102.36           24.57          43.33
CO  (PPM)           322.89            0.64           1.03
CO2 (%)               2.83            1.73           2.38

MASS EMISSIONS  (GRAMS/BAG)

NOX                   3.10            1.40           2.00
HC                    3.42            1.41           1.45
CO                   21.79            0.07           0.07
CO2                3019.94         3156.92        2537.01

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.52
HC                    0.49
CO                    1.26
CO2                 786.88

FUEL ECONOMY  (MILES/GAL)

EPAMPG               11.23
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                    ****** CVS 787 ******

                   *** IDENTIFICATION ***

TEST DATE: 2-10-76              ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: MIKE K
MATERIAL: GEM 68 OB/OF          TEST MILES: 1939

COMMENTS:        TRYING TO SET UP ELECTRIC CHOKE TIME
                 11.20 MPG AT 3748 CC

                     *** TEST DATA ***

TEMP: 56  F (WET)               PRES: 736.985  MM HG (BARO)
      77  F (DRY)                     23.756  MM HG (VAPOR)
     100  F (MIX)                     24.4125  IN. H20 (INLET)
RH:  23  %                            19.1625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3005
BLOWER RPM (ACT): 928.62        BLOWER RPM (CAL): 928.605

                   BAG 1            BAG 2           BAG 3
                 AIR    EX        AIR    EX       AIR    EX

TIME (SECS)        505.9            870.6           506.1
BLOWER REVS        7831             13473           7833
CO  (PPM)        1.00  257.00    1.00    2.00    1.00    2.00
HC  (PPM C)     14.20  107.60   16.40   36.40   16.00   56.80
NOX (PPM)        0.47   31.70    0.57    8.45    0.43   21.60
CO2 (%)          0.04    2.74    0.04    1.78    0.04    2.48

                 *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2018.31          3472.45          2018.33
DF               4.82898          7.51192          5.39047

CORRECTED CONCENTRATIONS

NOX (PPM)         31.33             7.96            21.25
HC  (PPM C)       96.34            22.18            43.77
CO  (PPM)        240.75             1.06             1.08
CO2 (%)            2.71             1.75             2.45

MASS EMISSIONS  (GRAMS/BAG)

NOX                2.85             1.25             1.94
HC                 3.18             1.26             1.44
CO                16.02             0.12             0.07
CO2             2850.61          3160.58          2576.69

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.43
HC                 0.46
CO                 0.94
CO2              780.67

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.41
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185<

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                    ****** CVS 794 ******

                   *** IDENTIFICATION ***

TEST DATE: 2-17-76                 ROAD TEST: NA
VEHICLE:  ETV 24                   DRIVER: MIKE K
MATERIAL: GEM 68-0B/0F             TEST MILES: 1997

COMMENTS:       SETUP TEST FOR ELECTRIC CHOKE
                11.03 MPG.

                     *** TEST DATA ***

TEMP: 55   F (WET)                 PRES: 744.985  MM HG (BARO)
      78   F (DRY)                       24.617  MM HG (VAPOR)
      100  F (MIX)                       24.85  IN. H20 (INLET)
RH:  18  %                               19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3010
BLOWER RPM (ACT): 928.527          BLOWER RPM (CAL): 928.516

                    BAG 1           BAG 2           BAG 3
                  AIR    EX       AIR    EX       AIR    EX

TIME (SECS)         505.8           867.6           505.9
BLOWER REVS         7828            13426           7829
CO  (PPM)       1.00  298.00   1.00     9.90   1.00     2.00
HC  (PPM C)     9.92  104.00  10.76    33.60   9.48    44.80
NOX (PPM)       0.68   32.00   0.78     8.24   0.68    19.60
CO2 (%)         0.04    2.94   0.04     1.74   0.04     2.50

                 *** CALCULATED RESULTS ***

                BAG 1           BAG 2           BAG 3

VMIX (CF)       2042.13         3502.51         2042.39
DF              4.49915         7.68212         5.35001

CORRECTED CONCENTRATIONS

NOX (PPM)          31.47            7.56           19.05
HC  (PPM C)        96.28           24.24           37.09
CO  (PPM)         278.63            8.65            1.03
CO2 (%)             2.91            1.71            2.47

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.83            1.17            1.71
HC                  3.21            1.39            1.24
CO                 18.76            1.00            0.07
CO2              3097.88         3114.66         2628.13

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.45
HC                  0.46
CO                  1.21
CO2               792.64

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.08
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                    ****** CVS 799 ******

                   *** IDENTIFICATION ***

TEST DATE: 2/18/76                 ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: MIKE K
MATERIAL: GEN 68 OB/OF             TEST MILES: 2008

COMMENTS:          NO PREP
                   11.0MPG

                      *** TEST DATA ***

TEMP: 62   F (WET)                 PRES: 728.335  MM HG (BARO)
      80   F (DRY)                       26.271   MM HG (VAPOR)
      100   F (MIX)                      24.15   IN. H20 (INLET)
RH:  35  %                               18.9   IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3005
BLOWER RPM (ACT): 928.606          BLOWER RPM (CAL): 928.657

                        BAG 1           BAG 2           BAG 3
                     AIR     EX      AIR     EX      AIR      EX

TIME (SECS)             506.5           868.3           506.6
BLOWER REVS             7839            13438           7841
CO  (PPM)           0.00  286.00    0.00    1.00    0.00     7.50
HC  (PPM C)        18.84   85.60   26.76   38.28   22.56    48.52
NOX (PPM)           0.42   27.44    0.55    8.73    0.48    19.24
CO2 (%)             0.04    2.93    0.06    1.78    0.05     2.47

                  *** CALCULATED RESULTS ***

                   BAG 1           BAG 2           BAG 3

VMIX (CF)          1996.39         3422.32         1996.9
DF                 4.51905         7.51153         5.41292

CORRECTED CONCENTRATIONS

NOX (PPM)            27.11            8.25           18.85
HC  (PPM C)          70.93           15.08           30.13
CO  (PPM)           266.64            0.95            7.06
CO2 (%)               2.90            1.73            2.43

MASS EMISSIONS  (GRAMS/BAG)

NOX                   2.69            1.40            1.37
HC                    2.31            0.84            0.98
CO                   17.55            0.11            0.46
CO2                3018.05         3084.01         2529.77

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.48
HC                    0.32
CO                    1.06
CO2                 776.50

FUEL ECONOMY  (MILES/GAL)

EPAMPG               11.36
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187<

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                    ****** CVS 301 ******

                 *** IDENTIFICATION ***

TEST DATE: 2-19-76                 ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: MIKE K
MATERIAL: GEM 58-08/0F             TEST MILES: 2020

COMMENTS:          RAN TEST TO SEE CHOKE
                   11.10 MPG.

                     *** TEST DATA ***

TEMP: 58  F (WET)                  PRES: 736.135  MM HG (BARO)
      30  F (DRY)                        25.271  MM HG (VAPOR)
      99  F (MIX)                        24.5  IN. H20 (INLET)
RH:  23  %                               19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3010
BLOWER RPM (ACT): 928.539          BLOWER RPM (CAL): 928.539

                      BAG 1            BAG 2            BAG 3
                   AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          505.1             868.2             505.4
BLOWER REVS          7832              13436             7838
CO  (PPM)        4.10  313.00     1.00     2.00     1.00     2.00
HC  (PPM C)     11.60   75.00    14.56    28.60    10.80    45.20
NOX (PPM)        0.46   29.70     0.35     9.17     0.55    20.00
CO2 (%)          0.04    2.89     0.05     1.76     0.04     2.47

                 *** CALCULATED RESULTS ***

                  BAG 1            BAG 2             BAG 3

VMIX (CF)        2022.74          3470.06           2024.23
DF               4.57313          7.60046           5.41478

CORRECTED CONCENTRATIONS

NOX (PPM)          29.34             8.43             19.55
HC  (PPM C)        65.93            15.95             35.37
CO  (PPM)         290.03             1.05              1.08
CO2 (%)             2.85             1.72              2.44

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.72             1.34              1.81
HC                  2.21             0.90              1.20
CO                 19.35             0.12              0.07
CO2              3015.56          3106.38           2573.07

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.47
HC                  0.34
CO                  1.13
CO2               732.33

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.27
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****** CVS 817 ******

*** IDENTIFICATION ***

TEST DATE: 3-2-76                 ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: MIKE K
MATERIAL: GEM 68-0B/0F            TEST MILES: 6477

COMMENTS:       BASELINE TEST NO CATALYST OF ANYKIND
                VEHICLE IN CATALYST CAIBRATION  3738 CC = 11.23 MPG.

                     *** TEST DATA ***

TEMP: 60  F (WET)                 PRES: 743.485  MM HG (BARO)
      82  F (DRY)                       28.021  MM HG (VAPOR)
      100  F (MIX)                      24.4125  IN. H20 (INLET)
RH:  25  %                              19.1625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3000
BLOWER RPM (ACT): 928.616         BLOWER RPM (CAL): 928.605

                       BAG 1           BAG 2           BAG 3
                    AIR     EX      AIR     EX      AIR     EX

TIME (SECS)            506.3           867.4           506
BLOWER REVS            7836            13423           7833
CO  (PPM)          9.70 3500.00   24.20 2700.00   14.00 3900.00
HC  (PPM C)       10.16  256.40   12.38  204.40   10.80  249.20
NOX (PPM)          0.65   48.09    1.12   13.70    0.83   35.90
CO2 (%)            0.04    2.61    0.05    1.51    0.04    2.11

                 *** CALCULATED RESULTS ***

                  BAG 1          BAG 2          BAG 3

VMIX (CF)         2035.1[illegible]       3485.14        2034.34
DF                4.51904        7.43431        5.34732

CORRECTED CONCENTRATIONS

NOX (PPM)           47.58          12.73          35.13
HC  (PPM C)        248.49         193.41         240.42
CO  (PPM)         3288.40        2578.92        3593.31
CO2 (%)              2.58           1.47           2.08

MASS EMISSIONS  (GRAMS/BAG)

NOX                  4.53           2.08           3.35
HC                   8.26          11.01           7.99
CO                 220.64         296.42         248.09
CO2               2736.97        2666.46        2204.02

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.79
HC                   2.55
CO                  71.03
CO2                679.95

FUEL ECONOMY  (MILES/GAL)

EPAMPG              11.07
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                     ****** CVS 820 ******

                   *** IDENTIFICATION ***

TEST DATE: 3-3-76                 ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: MIKE K
MATERIAL: GEM NONE                TEST MILES: 6502

COMMENTS:        2ND BASELINE TEST  NO CATALYST
                 OF ANY KIND  DIN TRACE    3725 CC = 11.28 MPG

                      *** TEST DATA ***

TEMP: 64  F (WET)                 PRES: 745.185  MM HG (BARO)
      78  F (DRY)                       24.617  MM HG (VAPOR)
     100  F (MIX)                       24.15  IN. H2O (INLET)
RH:  46  %                              19.075  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2993
BLOWER RPM (ACT): 928.536         BLOWER RPM (CAL): 928.64

                     BAG 1          BAG 2          BAG 3
                   AIR    EX      AIR    EX      AIR    EX

TIME (SECS)          505.1          867            505.6
BLOWER REVS          7832          13427           7815
CO  (PPM)        3.70 3900.00  11.60 2800.00   5.80 3900.00
HC  (PPM C)      6.08  301.24   8.68  205.60   8.92  260.40
NOX (PPM)        0.46   52.62   0.94   12.48   0.70   31.68
CO2 (%)          0.05    2.54   0.05    1.50   0.04    2.10

                  *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)        2036.28        3490.96        2031.86
DF               4.56518        7.49309        5.37186

CORRECTED CONCENTRATIONS

NOX (PPM)          52.25          11.67          31.11
HC  (PPM C)       296.49         198.08         253.14
CO  (PPM)        3648.52        2667.65        3679.75
CO2 (%)             2.50           1.46           2.07

MASS EMISSIONS  (GRAMS/BAG)

NOX                 5.56           2.13           3.30
HC                  9.85          11.29           8.40
CO                244.95         307.04         246.51
CO2              2555.82        2351.92        2190.70

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.85
HC                  2.71
CO                 73.72
CO2               672.35

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.13
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                    ****** CVS 622 ******

                   *** IDENTIFICATION ***

TEST DATE: 3-4-76                ROAD TEST: NA
VEHICLE:  ETV 24                 DRIVER: LARRY
MATERIAL: GEM NONE               TEST MILES: 6524

COMMENTS:        3 RD. TEST BASELINE NO CATALYST
                 .             3780 CC = 11.16 M.P.G.

                     *** TEST DATA ***

TEMP: 64   F (WET)               PRES: 743.485  MM HG (BARO)
      78   F (DRY)                     24.617  MM HG (VAPOR)
      100  F (MIX)                     24.5  IN. H20 (INLET)
RH:  43  %                             19.25  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3002
BLOWER RPM (ACT): 929.164        BLOWER RPM (CAL): 928.537

                    BAG 1            BAG 2             BAG 3
                 AIR    EX        AIR     EX        AIR     EX

TIME (SECS)         504.8            867.7             507.9
BLOWER REVS         7813             13430             7377
CO  (PPM)        2.20 3500.00   33.30 2300.00   14.00 3900.00
HC  (PPM C)      8.12  285.72   12.56  207.60   12.28  260.40
NOX (PPM)        0.51   54.22    1.45   12.97    0.89   33.33
CO2 (%)          0.05    2.58    0.06    1.55    0.06    2.13

                 *** CALCULATED RESULTS ***

                BAG 1            BAG 2            BAG 3

VMIX (CF)       2030.25          3489.86          2046.88
DF              4.56352          7.28848          5.20539

CORRECTED CONCENTRATIONS

NOX (PPM)         53.82            11.72            33.11
HC  (PPM C)      279.38           196.76           250.43
CO  (PPM)       3275.87          2649.23          3671.02
CO2 (%)            2.54             1.50             2.13

MASS EMISSIONS  (GRAMS/BAG)

NOX                5.60             2.09             3.47
HC                 9.26            11.21             8.37
CO               219.28           304.82           247.74
CO2             2690.31          2726.73          2275.30

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.86
HC                 2.66
CO                72.04
CO2              690.73

FUEL ECONOMY  (MILES/GAL)

EPAMPG            10.95
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                  ****** CVS 331 ******

                  *** IDENTIFICATION ***

TEST DATE: 3-16-76               ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: MIKE K
MATERIAL: GEM NONE               TEST MILES: 6536

COMMENTS:         HOT START - NO CAT. W/EGR
                  3636 CC = 11.55 MPG

                     *** TEST DATA ***

TEMP: 56   F (WET)               PRES: 736.185  MM HG (BARO)
      79   F (DRY)                     25.509  MM HG (VAPOR)
     100   F (MIX)                     24.15  IN. H2O (INLET)
RH:  19  %                             19.075  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3001
BLOWER RPM (ACT): 925.584        BLOWER RPM (CAL): 928.64

                     BAG 1             BAG 2            BAG 3
                   AIR    EX        AIR    EX        AIR    EX

TIME (SECS)          506.4            367.6            505.7
BLOWER REVS          7838             13426            7827
CO  (PPM)        7.00 3300.00    20.00 2800.00    36.00 3800.00
HC  (PPM C)      8.20  235.12    10.23  208.08     9.56  256.00
NOX (PPM)        0.53   40.15     1.16   13.70     0.34   35.30
CO2 (%)          0.04    2.42     0.06    1.52     0.06    2.14

                  *** CALCULATED RESULTS ***

                   BAG 1            BAG 2            BAG 3

VMIX (CF)         2016. 38         3453.94          2013.55
DF                4.35311          7.39965          5.30144

CORRECTED CONCENTRATIONS

NOX (PPM)           39.73            12.70            34.62
HC  (PPM C)        273.51           199.19           248.24
CO  (PPM)         3120.49          2633.70          3591.11
CO2 (%)              2.39             1.47             2.09

MASS EMISSIONS  (GRAMS/BAG)

NOX                  3.56             1.95             3.10
HC                   9.17            11.23             8.16
CO                 207.45           305.61           233.40
CO2               2511.34          2644.40          2196.03

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.70
HC                   2.54
CO                  70.75
CO2                663.47                       

FUEL ECONOMY  (MILES/GAL)
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                  ****** CVS 832 ******

                 *** IDENTIFICATION ***

TEST DATE: 3-16-76            ROAD TEST: NA
VEHICLE:  ETV 24              DRIVER: MIKE K
MATERIAL: GEM NONE            TEST MILES: 6548

COMMENTS:      HOT START - NO CAT - W/O EGR
               VACCUM LINES EGR BLOCKED      3307 CC -=12.70MPG

                   *** TEST DATA ***

TEMP: 57  F (WET)             PRES: 736.185  MM HG (BARO)
      80  F (DRY)                   26.271  MM HG (VAPOR)
      100  F (MIX)                  23.8  IN. H20 (INLET)
RH:  20  %                          18.9  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS         BLOWER SPEED:  3
FUEL: HO III                  CF/REV: .2993
BLOWER RPM (ACT): 928.582     BLOWER RPM (CAL): 928.693

                  BAG 1           BAG 2           BAG 3
                AIR    EX       AIR    EX       AIR    EX

TIME (SECS)       503.1           874.4           504.7
BLOWER REVS       7863            13534           7810
CO  (PPM)      13.30 3500.00  27.70 2800.00  23.20 3600.00
HC  (PPM C)     8.12  272.20   9.43  186.44   9.08  217.00
NOX (PPM)       0.81  140.00   1.39   44.40   1.20  133.00
CO2 (%)         0.05    2.00   0.06    1.36   0.04    1.98

                *** CALCULATED RESULTS ***

               BAG  1          BAG 2          BAG 3

VMIX (CF)       2019.84        3476.6         2006.23
DF              5.6744         8.12365        5.71269

CORRECTED CONCENTRATIONS

NOX (PPM)       139.33          43.18          132.01
HC  (PPM C)     265.51         178.13          209.51
CO  (PPM)      3331.75        2684.47         3420.51
CO2 (%)           1.96           1.31            1.95

MASS EMISSION S  (G RAMS/BAG)

NOX              12.64           6.74           11.90
HC                8.76          10.11            6.86
CO              221.88         307.70          226.25
CO2            206 3.31        2370.36         2037.05

WEIGHTED MASS  EMISSIONS  (GRAMS/MILE)

NOX               2.53
HC                2.37
CO               70.94
CO2             589.16

FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 834 ******

                   *** IDENTIFICATION ***

TEST DATE: 3-17-76              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: MIKE K
MATERIAL: GEM 69-52A/B          TEST MILES:

COMMENTS:        HOT START - W/CATALYST - W/EGR
                 TEMP & INLET TRRACE       3599 CC = 11.67 MPG

                      *** TEST DATA ***

TEMP: 54  F (WET)               PRES: 745.785  MM HG (BARO)
      77  F (DRY)                      23.756  MM HG (VAPOR)
      100  F (MIX)                     23.975  IN. H20 (INLET)
RH:  17  %                             18.9  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2988
BLOWER RPM (ACT): 928.556       BLOWER RPM (CAL): 928.575

                    BAG 1           BAG 2            BAG 3
                  AIR    EX       AIR    EX        AIR    EX

TIME (SECS)         504.3           369              505.1
BLOWER REVS         7804           13449             7317
CO   (PPM)       6.30    7.00    5.00    6.50   10.00   11.00
HC   (PPM C)     6.96   29.60    6.68   21.56    5.84   34.32
NOX (PPM)        0.80   14.42    0.87    9.20    0.63   21.80
CO2 (%)          0.06    2.49    0.07    1.73    0.07    2.44

                  *** CALCULATED RESULTS ***

                 BAG 1           BAG 2            BAG 3

VMIX (CF)        2028.18         3495.26          2031.56
DF               5.37371         7.73323          5.48175

CORRECTED CONCENTRATIONS

NOX (PPM)         13.77            8.44            21.28
HC  (PPM C)       23.94           15.74            29.55
CO  (PPM)          1.53            1.05             2.29
CO2 (%)            2.44            1.67             2.38

MASS EMISSIONS  (GRAMS/BAG)

NOX                1.22            1.29             1.89
HC                 0.79            0.90             0.98
CO                 0.10            0.12             0.15
CO2              2582.01         3042.31          2524.44

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.38
HC                 0.24
CO                 0.03
CO2              745.53

FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 835 ******

                  *** IDENTIFICATION ***

TEST DATE: 3-17-76              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: MIKE K
MATERIAL:  CEM 69-52A/B         TEST MILES: 10600

COMMENTS:         HOT START -W/CATALYST - WO EGR
                  CARBURETOR LEANED OUT          3330 CC = 12.62 MPG

                     *** TEST DATA ***

TEMP: 55   F (WET)              PRES: 746.385  MM HG (BARO)
      76   F (DRY)                    22.922  MM HG (VAPOR)
      100  F (MIX)                    24.15  IN. H2O (INLET)
RH:  22  %                            19.075  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2993
BLOWER RPM (ACT): 928.576       BLOWER RPM (CAL): 928.64

                   BAG 1          BAG 2          BAG 3
                 AIR    EX      AIR    EX      AIR    EX

TIME (SECS)        505.1          363.3          505.5
BLOWER REVS        7317           13435          7328
CO  (PPM)        2.80   3.00    2.90   3.00    5.00   6.00
HC  (PPM C)      5.52  27.20    5.52  21.16    5.44  23.40
NOX (PPM)        0.49  74.17    0.78  23.64    0.69  84.10
CO2 (%)          0.05   2.36    0.06   1.59    0.06   2.29

                 *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)        2035.24        3493.72        2035.1
DF               5.67075        3.41495        5.84233

CORRECTED CONCENTRATIONS

NOX (PPM)          73.77          22.95          83.53
HC  (PPM C)        22.65          16.30          23.89
CO  (PPM)           0.55           0.35           1.58
CO2 (%)             2.32           1.54           2.24

MASS EMISSIONS  (GRAMS/BAG)

NOX                 7.15           3.58           7.50
HC                  0.75           0.93           0.80
CO                  0.04           0.04           0.11
CO2              2431.14        2304.62        2391.11

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.47
HC                  0.23
CO                  0.02
CO2               696.02

FUEL ECONOMY  (MILES/GAL)

[illegible]         12.77
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                        ****** CVS 838 ******

                       *** IDENTIFICATION ***

TEST DATE: 3-19-76                  ROAD TEST: NA
VEHICLE:   ETV 24                   DRIVER: MIKE K
MATERIAL: GEM 69-52A/B              TEST MILES: 6586VM

COMMENTS:          HOT START - W/O EGR - W/CATALYST
                   MANIFOLDS INSULATED FROM ENGINE TOO GETTER 3271 CC=12.34
MPG

                         *** TEST DATA ***

TEMP: 60   F (WET)                PRES: 745.185  MM HG (BARO)
      77   F (DRY)                      23.758  MM HG (VAPOR)
      100  F (MIX)                      23.8  IN. H20 (INLET)
RH:   35  %                             13.9  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2986
BLOWER RPM (ACT): 923.568         BLOWER RPM (CAL): 923.693

                     BAG 1             BAG 2              BAG 3
                  AIR     EX        AIR     EX         AIR     EX

TIME (SECS)          504.5             868.5              504.6
BLOWER REVS          7308              13440              7810
CO  (PPM)         1.30     2.00     1.00     2.00     1.00     2.00
HC  (PPM C)       5.20    25.40     5.08    19.76     4.84    27.88
NOX (PPM)         0.53    62.99     0.75    18.26     0.67    81.22
CO2 (%)           0.05     2.32     0.06     1.60     0.04     2.28

                     *** CALCULATED RESULTS ***

                  BAG 1              BAG 2              BAG 3

VMIX (CF)        2027.05            3489.19            2027.57
DF               5.76908            8.36367            5.86953

CORRECTED CONCENTRATIONS

NOX (PPM)          62.55              17.60              80.65
HC  (PPM C)        21.10              15.29              23.86
CO  (PPM)           0.83               1.05               1.07
CO2 (%)             2.23               1.55               2.25

MASS EMISSIONS  (GRAMS/BAG)

NOX                 6.12               2.96               7.90
HC                  0.70               0.37               0.79
CO                  0.05               0.12               0.07
CO2              2408.60            2815.25            2375.73

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.35
HC                  0.22
CO                  0.02
CO2               594.03

FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 839 ******

                   *** IDENTIFICATION ***

TEST DATE: 3-19-76                ROAD TEST: NA
VEHICLE:   ETV 24                 DRIVER: MIKE K
MATERIAL: GEM 69-52A/B            TEST MILES: 6598VM

COMMENTS:        HOT START - W/EGR - W/CATALYST
                 INSULATED MANIFOLDS         3531 CC = 11.90 MPG

                     *** TEST DATA ***

TEMP: 61   F (WET)                PRES: 739.785  MM HG (BARO)
      77   F (DRY)                      23.758  MM HG (VAPOR)
      100  F (MIX)                      23.625  IN. H20 (INLET)
RH:  39  %                              18.725  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2986
BLOWER RPM (ACT): 928.597         BLOWER RPM (CAL): 928.728

                    BAG 1              BAG 2             BAG 3
                 AIR     EX         AIR     EX        AIR     EX

TIME (SECS)         504.7              868.2             504.9
BLOWER REVS         7311               13437             7814
CO  (PPM)        1.00     2.00     1.00     2.00     1.00     2.00
HC  (PPM C)      4.76    25.12     5.40    18.60     6.68    28.56
NOX (PPM)        0.44    17.95     0.46     7.63     0.35    13.00
CO2 (%)          0.04     2.47     0.04     1.70     0.05     2.44

                  *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2012.77          3462.5           2013.54
DF               5.41918          7.87285          5.48496

CORRECTED CONCENTRATIONS

NOX (PPM)          17.59             7.23            12.71
HC  (PPM C)        21.24            13.89            23.10
CO  (PPM)           1.07             1.05             1.07
CO2 (%)             2.44             1.67             2.40

MASS EMISSIONS  (GRAMS/BAG)

NOX                 1.75             1.24             1.27
HC                  0.70             0.79             0.76
CO                  0.07             0.12             0.07
CO2              2553.42          3006.62          2519.22

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.36
HC                  0.20
CO                  0.03
CO2               739.03

FUEL ECONOMY  (MILES/GAL)
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                       ****** CVS 345 ******

                      *** IDENTIFICATION ***

TEST DATE: 3-24-76                 ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: LARRY
MATERIAL: GEM 69-52 A/B            TEST MILES: 6685 VM

COMMENTS:           HOT START - W/O EGR - W/CAT
                    INSULATED MANIFOLDS        3272 CC = 12.84 MPG

                         *** TEST DATA ***

TEMP: 60   F (WET)                 PRES: 764.435  MM HG (BARO)
      76   F (DRY)                       22.922  MM HG (VAPOR)
      100  F (MIX)                       23.975  IN. H20 (INLET)
RH:  35  %                               18.9  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2974
BLOWER RPM (ACT): 928.736          BLOWER RPM (CAL): 928.675

                    BAG 1          BAG 2          BAG 3
                  AIR    EX      AIR    EX      AIR    EX

TIME (SECS)         506.2          866.8          505.1
BLOWER REVS         7838           13416          7817
CO   (PPM)        1.00    2.00   2.00    3.00   1.00    2.00
HC   (PPM C)      4.68   21.68   4.60   19.20   5.08   27.72
NOX  (PPM)        0.46   73.84   0.59   21.80   0.30   79.95
CO2  (%)          0.05    2.29   0.05    1.59   0.06    2.34

                    *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2081.42          3562.68          2075.84
DF               5.84551          3.41599          5.71926

CORRECTED CONCENTRATIONS

NOX (PPM)          73.46            21.28            79.45
HC   (PPM C)       17.30            15.15            23.53
CO   (PPM)          1.07             1.13             1.07
CO2  (%)            2.25             1.55             2.29

MASS EMISSIONS  (GRAMS/BAG)

NOX                 7.29             3.62             7.87
HC                  0.61             0.88             0.80
CO                  0.07             0.13             0.07
CO2              2440.71          2872.26          2479.57

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.50
HC                  0.21
CO                  0.03
CO2               711.35

FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 343 ******

                   *** IDENTIFICATION ***

TEST DATE: 3-24-76               ROAD TEST: NA
VEHICLE:  ETV 24                 DRIVER: LARRY
MATERIAL: GEM 69 -52 A/B         TEST MILES: 6596VM

COMMENTS:         HOT START - INSULATED MANIFOLDS
                  W/EGR - W/CAT        3593CC = 11.69 MPG

                      *** TEST DATA ***

TEMP: 72   F (WET)               PRES: 745.785  MM HG (BARO)
      78   F (DRY)                     24.617  MM HG (VAPOR)
      100   F (MIX)                    23.8  IN. H20 (INLET)
RH:  72  %                             13.025  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2975
BLOWER RPM (ACT): 928.702        BLOWER RPM (CAL): 928.781

                    BAG 1           BAG 2            BAG 3
                  AIR    EX       AIR    EX        AIR     EX

TIME (SECS)         504.7           868              504.5
BLOWER REVS         7812           13436             7808
CO  (PPM)        1.00     2.00   1.00     2.00   1.00     2.00
HC  (PPM C)      4.92    25.28   4.68    17.88   4.44    26.80
NOX (PPM)        0.57    14.13   0.58     8.59   0.44    13.06
CO2 (%)          0.06     2.56   0.05     1.77   0.05     2.51

                 *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2021.35          3477.42          2020.82
DF               5.22883          7.56218          5.33256

CORRECTED CONCENTRATIONS

NOX (PPM)          13.72            8.09             12.70
HC  (PPM C)        21.30           13.82             23.19
CO  (PPM)           1.06            1.04              1.06
CO2 (%)             2.51            1.73              2.47

MASS EMISSIONS  (GRAMS/BAG)

NOX                 1.76            1.78              1.63
HC                  0.70            0.78              0.77
CO                  0.07            0.12              0.07
CO2              2648.09         3131.17           2602.37

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.46
HC                  0.20
CO                  0.03
CO2               767.09

FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 847 ******

                  *** IDENTIFICATION ***

TEST DATE: 3-24-76               ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: LARRY
MATERIAL: GEM 69 -52 A/B         TEST MILES: 6710 VM

COMMENTS:         MANUAL LOAD - 18.5 HP - HOT START - W/EGR
                  CARBURETOR WENT RICH DURING SECOND BAG   4439CC = 9.4
G

                      *** TEST DATA ***

TEMP: 72   F (WET)               PRES: 745.585  MM HG (BARO)
      73   F (DRY)                     24.617  MM HG (VAPOR)
      100   F (MIX)                    23.975  IN. H2O (INLET)
RH:  71  %                             13.9  IN. H2O (OUTLET)
INERTIA WT.: 4500 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2988
BLOWER RPM (ACT): 928.624        BLOWER RPM (CAL): 928.675

                     BAG 1           BAG 2           BAG 3
                   AIR    EX      AIR    EX       AIR    EX

TIME (SECS)          505.4           333.1           503.6
BLOWER REVS          7822            13435           7795
CO  (PPM)         1.00   10.00   2.00   70.00   1.00  420.00
HC  (PPM C)       4.32   15.32   4.56    6.92   4.64   13.76
NOX (PPM)         0.41    9.88   0.45    6.76   0.43   11.00
CO2 (%)           0.04    3.16   0.06    2.26   0.05    3.31

                  *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)         2032.38          3490.8           2025.37
DF                4.23722          5.9103           4.00031

CORRECTED CONCENTRATIONS

NOX (PPM)           9.57             6.39             10.64
HC  (PPM C)        12.02             3.13             10.28
CO  (PPM)           8.42            63.73            332.87
CO2 (%)             3.13             2.21              3.27

MASS EMISSIONS  (GRAMS/BAG)

NOX                 1.22             1.40              1.35
HC                  0.40             0.18              0.34
CO                  0.56             7.33             25.57
CO2              3316.85          4023.48           3456.51

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.36
HC                  0.07
CO                  2.95
CO2               989.32

FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 350 ******

                  *** IDENTIFICATION ***

TEST DATE: 3-25-76               ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: MIKE K
MATERIAL: GEM 69-52A/E           TEST MILES: 6740VM

COMMENTS:         HOT START - MANUAL LOAD - 18.5 HP - W/O EGR
                  W/CAT - NO VAC. ADV - INSULATED MAN.

                     *** TEST DATA ***

TEMP: 53  F (WET)                PRES: 744.785  MM HG (BARO)
      69  F (DRY)                      18.197  MM HG (VAPOR)
      100  F (MIX)                     23.975  IN. H2O (INLET)
RH:  29  %                             18.9  IN. H2O (OUTLET)
INERTIA WT.: 4500 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2989
BLOWER RPM (ACT): 928.716        BLOWER RPM (CAL): 928.375

                  BAG 1           BAG 2           BAG 3
                AIR    EX       AIR    EX       AIR    EX

TIME (SECS)       505.7           857.5           505.2
BLOWER REVS       7828            13427           7820
CO  (PPM)       1.00    2.00    1.00    2.00    1.00    2.00
HC  (PPM C)     4.00   18.40    4.00   15.40    3.60   22.38
NOX (PPM)       0.53   49.53    0.94   12.85    0.55   59.15
CO2 (%)         0.04    2.77    0.06    1.93    0.06    2.74

                 *** CALCULATED RESULTS ***

                BAG 1           BAG 2           BAG 3

VMIX (CF)       2032.04         3485.46         2029.96
DF              4.83401         6.93678         4.8861

CORRECTED CONCENTRATIONS

NOX (PPM)         49.11           12.05           58.71
HC  (PPM C)       15.23           11.98           20.02
CO  (PPM)          1.09            1.06            1.09
CO2 (%)            2.74            1.88            2.69

MASS EMISSIONS  (GRAMS/BAG)

NOX                4.43            1.83            5.35
HC                 0.51            0.53            0.66
CO                 0.07            0.12            0.07
CO2             2901.77         3414.76         2850.12

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.91
HC                 0.17
CO                 0.03
CO2              333.23

FUEL ECONOMY  (MILES/GAL)
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                    ****** CVS 851 ******

                  *** IDENTIFICATION ***

TEST DATE: 3-26-76               ROAD TEST: JA
VEHICLE:  ETV 24                 DRIVER: MIKE K
MATERIAL: GEM JUNE               TEST MILES: 6753

COMMENTS:       HOT START - NO/CAT W/O EGR - NO VAC.
                ADV. - INSULATED MANIFOLDS     4107 CC= 10.22

                     *** TEST DATA ***

TEMP: 63  F (WET)                PRES: 742.185  MM HG (BARO)
      76  F (DRY)                      22.922  MM HG (VAPOR)
      100  F (MIX)                     23.975  IN. H20 (INLET)
RH:  48  %                             18.9  IN. H20 (OUTLET)
INERTIA WT.: 4500 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2991
BLOWER RPM (ACT): 928.565        BLOWER RPM (CAL): 928.675

                   BAG 1            BAG 2            BAG 3
                 AIR     EX       AIR     EX       AIR     EX

TIME (SECS)        504.7            868.1            506.1
BLOWER REVS        7810             13435            7833
CO  (PPM)       1.00 3900.00   22.70 1510.00   25.80 4200.00
HC  (PPM C)     5.03  191.40    5.75  132.72    7.20  209.66
NOX (PPM)       0.53  111.50    1.17   37.53    0.94  109.50
CO2 (%)         0.04    2.55    0.05    1.72    0.05    2.55

                *** CALCULATED RESULTS ***

                BAG 1            BAG 2            BAG 3

VMIX (CF)       2021.2           3475.93          2027.15
DF              4.55132          7.13931          4.52116

CORRECTED CONCENTRATIONS

NOX (PPM)       111.05            36.52           108.77
HC  (PPM C)     187.44           126.91           204.07
CO  (PPM)       3646.57          1417.38          3908.93
CO2 (%)            2.53             1.68             2.51

MASS EMISSIONS  (GRAMS/BAG)

NOX               11.63             6.50            11.43
HC                 6.19             7.21             5.75
CO               243.00           152.48           261.25
CO2             2635.43          3040.78          2654.59

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                2.42
HC                 1.33
CO                55.45
CO2              750.01                     202<

FUEL ECONOMY  (MILES/GAL)
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****** CVS 853 * ****

*** IDENTIFICATION ***

TEST DATE: 3-29-75                ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: MIKE K
MATERIAL: GEM NONE                TEST MILES: 6767

                 W/O EGR
COMMENTS:        [redacted] HOT START  NO VAC. ADV.
                 INSULATED MANIFOLDS  4093 CC = 10.26 MPG.

*** TEST DATA ***

TEMP: 62   F (WET)                PRES: 745.135  MM HG (BARO)
      78   F (DRY)                      24.617  MM HG (VAPOR)
      100  F (MIX)                      24.0625  IN. H20 (INLET)
RH:  39  %                              19.1625  IN. H20 (OUTLET)
INERTIA WT.: 4500 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2993
BLOWER RPM (ACT): 923.638         BLOWER RPM (CAL): 928.64

                      BAG 1           BAG 2            BAG 3
                    AIR     EX      AIR     EX       AIR     EX

TIME (SECS)           504.7           868.3            505.3
BLOWER REVS           7311            13440            7320
CO   (PPM)          0.20 3400.00  14.60 1527.00  24.10 3600.00
HC   (PPM C)        4.44  180.40   5.28  122.04   6.08  134.30
NOX (PPM)           0.25  138.00   0.38   39.39   0.55  133.00
CO2 (%)             0.04    2.63   0.04    1.66   0.04    2.58

*** CALCULATED RESULTS ***

                  BAG 1           BAG 2           BAG 3

VMIX (CF)         2033.59         3499.09         2035.93
DF                4.51704         7.37033         4.56393

CORRECTED CONCENTRATIONS

NOX (PPM)          137.31           38.30          132.57
HC  (PPM C)        175.94          117.48          180.05
CO  (PPM)         3184.39         1443.51         3357.27
CO2 (%)              2.60            1.63            2.55

MASS EMISSIONS  (GRAMS/BAG)

NOX                 13.97            6.77           13.46
HC                   5.88            6.71            5.99
CO                 213.54          166.68          225.35
CO2               2756.13         2966.04         2706.12

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  2.73
HC                   1.67
CO                  51.32
CO2                759.15

FUEL ECONOMY  (MILES/GAL)

EPAMPG              10.44
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                    ****** CVS 555 ******

                   *** IDENTIFICATION ***

TEST DATE: 3-30-76                 ROAD TEST: NA
VEHICLE:  LTV 24                   DRIVER: MIKE [illegible]
MATERIAL: GEM NONE                 TEST MILES: 5737

COMMENTS:        HOT START VAC. ADV. W/O EGR
                 INSULATED MANIFOLDS  3286 CC = 12.78 MPG.

                     *** TEST DATA ***

TEMP: 62   F (WET)                 PRES: 739.185  MM HG (BARO)
      75   F (DRY)                       22.243  MM HG (VAPOR)
      100   F (MIX)                      23.7125  IN. H20 (INLET)
RH:  47  %                               18.8125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2989
BLOWER RPM (ACT): 928.628          BLOWER RPM (CAL): 928.71

                    BAG 1            BAG 2            BAG 3
                  AIR    EX        AIR    EX        AIR    EX

TIME (SECS)         504.2            869.2            505.5
BLOWER REVS         7804             13453            7823
CO  (PPM)       4.20 3350.00   26.00 1362.00   19.50 3330.00
HC  (PPM C)     6.28  234.00    9.84  165.60    9.26  234.30
NOX (PPM)       0.33  137.00    1.22   44.50    0.83  131.00
CO2 (%)         0.04    2.08    0.04    1.42    0.06    2.05

                  *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2010.57          3465.12          2015.57
DF               5.53742          8.55154          5.60629

CORRECTED CONCENTRATIONS

NOX (PPM)        135.73            43.42           130.32
HC  (PPM C)      223.85           156.91           227.13
CO  (PPM)       3161.62          1281.43          3151.17
CO2 (%)            2.05             1.33             2.00

MASS EMISSIONS  (GRAMS/BAG)

NOX               14.06             7.69            13.43
HC                 7.51             8.83             7.47
CO               209.59           146.45           209.41
CO2             2146.65          2502.92          2102.98

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                2.35
HC                 2.18
CO                47.46
CO2              616.62

FUEL ECONOMY  (MILES/GAL)

EPAMPG            12.76
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                 ****** CVS 856 ******

               *** IDENTIFICATION ***

TEST DATE: 3-30-76             ROAD TEST: NA
VEHICLE:  ETV 24               DRIVER: MIKE K
MATERIAL: GEM NONE             TEST MILES: 6799

COMMENTS:        HOT START  W/EGR  VAC. ADV. INSULATED MANIFOLDS
                 VEHICLE STOCK SPECS.        3562 CC = 11.79 MPG.

                    *** TEST DATA ***

TEMP: 63  F (WET)              PRES: 739.085  MM HG (BARO)
      77  F (DRY)                     23.756  MM HG (VAPOR)
      100  F (MIX)                    23.625  IN. H20 (INLET)
RH:  45  %                            18.3125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .2987
BLOWER RPM (ACT): 928.505      BLOWER RPM (CAL): 928.719

                  BAG 1           BAG 2           BAG 3
                AIR    EX       AIR    EX       AIR    EX

TIME (SECS)       505.4           867.8     .      505.1
BLOWER REVS       7322            13430            7313
CO  (PPM)       4.80 3900.00  32.30 2700.00  27.40 3750.00
HC  (PPM C)     7.68  245.32  10.08  206.40  10.44  271.20
NOX (PPM)       0.37   35.63   0.50   12.50   0.57   34.90
CO2 (%)         0.05    2.24   0.07    1.57   0.07    2.15

               *** CALCULATED RESULTS ***

               BAG 1           BAG 2           BAG 3

VMIX (CF)       2014.7          3459.15         2013.57
DF              5.0911          7.2439          5.27335

CORRECTED CONCENTRATIONS

NOX (PPM)        35.35           12.07           34.44
HC  (PPM C)     239.15          197.71          262.74
CO  (PPM)      3671.34         2551.29         3517.59
CO2 (%)           2.20            1.51            2.10

MASS EMISSIONS  (GRAMS/BAG)

NOX               3.67            2.15            3.57
HC                7.87           11.17            8.64
CO              243.87          290.97          233.54
CO2            2311.28         2723.34         2208.71

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.77
HC                2.60
CO               70.53
CO2             663.49

FUEL ECONOMY  (MILES/GAL)

EPAMPG           11.34
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                    ****** CVS 357 ** ***

                   *** IDENTIFICATION ***

TEST DATE: 3-30-76                ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: MIKE K
MATERIAL: OEM NONE                TEST MILES: 5812

COMMENTS:        HOT START MANUAL LOAD 18.5 H.P. NO VAC. ADV.
                 INSULATED MANIFOLDS     4531 CC = 2--9.27 MPG.

                      *** TEST DATA ***

TEMP:  65  F (WET)                PRES: 737.385  MM HG (BARO)
       79  F (DRY)                       25.509  MM HG (VAPOR)
      100  F (MIX)                       23.7125  IN. H2O (INLET)
RH:  50  %                               18.8125  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2990
BLOWER RPM (ACT): 928.619         BLOWER RPM (CAL): 928.71

                      BAG 1              BAG 2            BAG 3
                   AIR     EX         AIR     EX        AIR     EX

TIME (SECS)           504.9              868.6             505
BLOWER REVS           7315               13443             7331
CO  (PPM)         5.20 4975.00      53.70 4050.00     4.84 5650.00
HC  (PPM C)       7.20  237.20      10.36  182.00     9.92  295.64
NOX (PPM)         0.53   40.60       0.91   15.15     1.09   40.56
CO2 (%)           0.04    2.83       0.06    1.94     0.05    2.70

                  *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)         2009.24          3456.2           2013.35
DF                4.04091          5.72274          4.06331

CORRECTED CONCENTRATIONS

NOX (PPM)           40.20            14.40            39.74
HC  (PPM C)        231.78           173.45           288.16
CO  (PPM)         4619.78          3789.74          5634.25
CO2 (%)              2.80             1.89             2.66

MASS EMISSIONS  (GRAMS/BAG)

NOX                  4.41             2.71             4.36
HC                   7.60             9.79             9.47
CO                 306.04           431.84           374.00
CO2               2933.73          3407.42          2795.30

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.95
HC                   2.45
CO                 103.55
CO2                834.97

FUEL ECONOMY  (MILES/GAL)

EPAMPG               8.98
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                    ****** CVS 351 ******

                    *** IDENTIFICATION ***

TEST DATE: 4-1-76                 ROAD TEST: NA
VEHICLE:  LTV 24                  DRIVER: MIKE K
MATERIAL: GEN 69-52-A/L           TEST MILES:
                                    A
COMMENTS:         COLD START  INSULTED  MANIFOLDS
                  HEAT UP RATE POOR 3319 CC =11 MPG.

                       *** TEST DATA ***

TEMP: 54   F (WET)                PRES: 733.955  MM HG (BARO)
      70   F (DRY)                      18.755  MM HG (VAPOR)
      100   F (MIX)                     23.8875  IN. H2O (INLET)
RH:  33  %                              18.9875  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2993
BLOWER RPM (ACT): 928.704         BLOWER RPM (CAL): 928.675

                    BAG 1            BAG 2            BAG 3
                  AIR     EX      AIR     EX       AIR     EX

TIME (SECS)        505.4            867.9            505.9
BLOWER REVS        7823             13433            7831
CO  (PPM)       2.90  236.00     3.70     4.00    1.00     6.60
HC  (PPM C)     9.43   79.03    10.88    27.40    9.24    35.03
NOX (PPM)       0.26   52.95     0.43     7.55    0.22    22.50
CO2 (%)         0.04    2.87     0.06     1.83    0.06     2.58

                  *** CALCULATED RESULTS ***

                BAG 1             BAG 2              BAG 3

VMIX (CF)       2017.35           3434.02            2019.41
DF              4.62077           7.30993            5.1355

CORRECTED CONCENTRATIONS

NOX (PPM)         52.76              7.14              22.32
HC  (PPM C)       71.55             13.01              27.32
CO  (PPM)        213.20              0.55               5.40
CO2 (%)            2.84              1.78               2.53

MASS EMISSION S  (GRAMS/BAG)

NOX                4.89              1.13               2.07
HC                 2.35              1.02               0.91
CO                14.51              0.07               0.55
CO2             2983.40           3212.31            2556.05

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.59
HC                 0.34
CO                 0.87
CO2              802.15

FUEL ECONOMY  (MILES/GAL)
                                        207<
CARB.             11.05
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****** CVS 862 ******

*** IDENTIFICATION ***

TEST DATE: 4-2-73                     ROAD TEST: NA
VEHICLE:  ETV 24                      DRIVER: MIKE K
MATERIAL: GEM ~~69-53~~               TEST MILES:
              69-52A/B
COMMENTS:        COLD START  INSULATED MANIFOLDS
                 POOR HEAT UPRATE  3819 CC = 11 MPG.

*** TEST DATA ***

TEMP: 53   F (WET)                    PRES: 742.585  MM HG (BARO)
      69   F (DRY)                          13.197  MM HG (VAPOR)
      100  F (MIX)                          23.8  IN. H2O (INLET)
RH:  32  %                                  18.9  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS                 BLOWER SPEED:  3
FUEL: HO III                          CF/REV: .2988
BLOWER RPM (ACT): 928.562             BLOWER RPM (CAL): 928.693

                     BAG 1              BAG 2              BAG 3
                  AIR     EX         AIR     EX         AIR     EX

TIME (SECS)          506.3              867                505.3
BLOWER REVS          7836               13417              7828
CO  (PPM)        2.7 0  233.00     2.50     3.00      1.00     1.50
HC  (PPM C)      5.16    71.32     5.92    21.04      5.76    29.12
NOX (PPM)        0.23    58.16     0.75     7.37      0.25    20.30
CO2 (%)          0.04     2.83     0.05     1.86      0.06     2.54

*** CALCULATED RESULTS ***

                 BAG 1              BAG 2              BAG 3

VMIX (CF)        2028.14            3472.53            2026.07
DF               4.68632            7.19505            5.26926

CORRECTED CONCENTRATIONS

NOX (PPM)          57.98              6.72               20.10
HC  (PPM C)        67.25             15.94               24.43
CO  (PPM)         220.47              0.73                0.51
CO2 (%)             2.30              1.82                2.49

MASS EMISSIONS  (GRAMS/BAG)

NOX                 5.35              1.06                1.85
HC                  2.23              0.90                0.81
CO                 14.74              0.08                0.04
CO2              2959.94           3290.45             2632.39

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.59
HC                  0.31
CO                  0.86
CO2               808.49

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.04
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                    ****** CVS 334 * ****

                   *** IDENTIFICATION ***

TEST DATE: 4-3-75                  ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: MIKE K
MATERIAL: GEM ~~69-52 C/H~~        TEST MILES:
             69-52-A/B
COMMENTS:        COLD START INSULATED MANIFOLDS
                 4097 CC = 10.25 MPG.

                     *** TEST DATA ***

TEMP: 53   F (WET)                 PRES: 747.285  MM HG (BARO)
      68   F (DRY)                        17.535  MM HG (VAPOR)
      100  F (MIX)                        23.975  IN. H2O (INLET)
RH:  34  %                                18.9375  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2938
BLOWER RPM (ACT): 928.506          BLOWER RPM (CAL): 928.555

                  BAG 1            BAG 2             BAG 3
                AIR    EX        AIR     EX        AIR     EX

TIME (SECS)       505.8            867.9             505.9
BLOWER REVS       7827             13431             7829
CO  (PPM)       1.30 1015.00    11.80    12.00     1.00     1.50
HC  (PPM C)     6.40  166.03     8.24    21.35     6.24    27.24
NOX (PPM)       0.37   42.45     0.62     6.90     0.13    15.50
CO2 (%)         0.04    3.30     0.05     1.90     0.05     2.56

                *** CALCULATED RESULTS ***

                BAG 1            BAG 2             BAG 3

VMIX (CF)       2033.43          3498.             2039.
DF              3.92399          7.04048           5.22852

CORRECTED CONCENTRATIONS

NOX (PPM)         42.17            6.37             15.35
HC  (PPM C)      161.31           14.29             22.19
CO  (PPM)        938.05            1.42              0.51
CO2 (%)            3.27            1.86              2.52

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.92            1.02              1.43
HC                 5.37            0.82              0.74
CO                63.04            0.16              0.04
CO2             3476.42         3337.73           2679.15

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.47
HC                 0.47
CO                 3.64
CO2              854.53

FUEL ECONOMY  (MILES/GAL)

EPAMPG            10.19
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                    ****** CVS 867 ******

                   *** IDENTIFICATION ***

TEST DATE: 4-6-76               ROAD TEST: NA
VEHICLE:  ETV 24                 DRIVER: MIKE K
MATERIAL: GEM 68                TEST MILES: 6893 VM

COMMENTS:        COLD IDLE TOO LOW CHOKE COULD BE RICHER
                 READJUSTED IDLE  3778 CC = 11.12 MPG.

                      *** TEST DATA ***

TEMP: 55   F (WET)              PRES: 742.785  MM HG (BARO)
      69   F (DRY)                    18.197  MM HG (VAPOR)
      100   F (MIX)                   24.15  IN. H20 (INLET)
RH:  30  %                            19.075  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2995
BLOWER RPM (ACT): 928.597       BLOWER RPM (CAL): 928.64

                   BAG 1           BAG 2           BAG 3
                 AIR    EX       AIR     EX      AIR     EX

TIME (SECS)        505.7           867.6           505.6
BLOWER REVS        7826            13427            7826
CO  (PPM)        2.50  330.00    3.10     3.50   1.00     1.90
HC  (PPM C)      5.48   84.04    6.20    22.32   6.20    34.60
NOX (PPM)        0.20   52.67    0.57     8.05   0.26    19.10
CO2 (%)          0.04    2.87    0.06     1.82   0.07     2.55

                  *** CALCULATED RESULTS ***

                BAG 1            BAG 2             BAG 3

VMIX (CF)       2029.01          3481.16           2029.01
DF              4.60598          7.35227           5.24741

CORRECTED CONCENTRATIONS

NOX (PPM)         52.51             7.56             18.89
HC  (PPM C)       79.75            16.96             29.58
CO  (PPM)        306.63             0.69              0.99
CO2 (%)            2.84             1.77              2.49

MASS EMISSIONS  (GRAMS/BAG)

NOX                4.80             1.19              1.73
HC                 2.64             0.96              0.98
CO                20.51             0.08              0.07
CO2             3003.70          3209.97           2638.28

WEIGHTED MASS  EMISSIONS  (GRAMS/MILE)

NOX                0.56
HC                 0.35
CO                 1.19
CO2              800.72

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.07
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                    ****** CVS 869 ******

                    *** IDENTIFICATION ***

TEST DATE: 4-7-76                ROAD TEST: NA
VEHICLE:  ETV 24                 DRIVER: MIKE K
MATERIAL: GEM 68 OB/OF           TEST MILES: 6914 VM

COMMENTS:        COLD IDLE INCREASED
                 CHOKE RICHER  3872 CC = 10.85 MPG.

                      *** TEST DATA ***

TEMP: 56  F (WET)                PRES: 746.685  MM HG (BARO)
      73  F (DRY)                      20.815  MM HG (VAPOR)
      100  F (MIX)                     24.0625  IN. H20 (INLET)
RH:  32  %                             18.9875  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2990
BLOWER RPM (ACT): 928.714        BLOWER RPM (CAL): 928.657

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          506.1            868.2            506.3
BLOWER REVS          7833             13439            7837
CO  (PPM)         1.00  366.00     2.90     3.00    1.00     9.70
HC  (PPM C)       7.20   84.96     6.92    22.96    6.48    39.88
NOX (PPM)         0.56   48.61     0.59     9.42    0.33    20.10
CO2 (%)           0.05    2.94     0.06     1.84    0.06     2.58

                   *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)         2038.99          3498.27          2040.03
DF                4.49265          7.2724           5.18395

CORRECTED CONCENTRATIONS

NOX (PPM)           48.17             8.91            19.83
HC  (PPM C)         79.36            16.99            34.65
CO  (PPM)          340.73             0.39             8.32
CO2 (%)              2.90             1.79             2.53

MASS EMISSIONS  (GRAMS/BAG)

NOX                  4.55             1.44             1.88
HC                   2.64             0.97             1.15
CO                  22.91             0.04             0.56
CO2               3084.86          3262.39          2693.28

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.60
HC                   0.37
CO                   1.36
CO2                816.54

FUEL ECONOMY  (MILES/GAL)

EPAMPG              10.83
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211<

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                    ****** CVS 872 ******

                    *** IDENTIFICATION ***

TEST DATE: 4-8-76                  ROAD TEST: NA
VEHICLE:  ETV 24                   DRIVER: MIKE K
MATERIAL: GEM 69-52-A/B            TEST MILES:

COMMENTS:        VEHICLE UNCHANGED FROM TEST 869  4093 CC = 10.26 MPG.
                 CHOKE RICHER AT START OF TEST (872)

                      *** TEST DATA ***

TEMP: 52  F (WET)                  PRES: 750.335  MM HG (BARO)
      70  F (DRY)                         18.765  MM HG (VAPOR)
      100  F (MIX)                        26.425  IN. H20 (INLET)
RH:  25  %                                21.7  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3053
BLOWER RPM (ACT): 928.097          BLOWER RPM (CAL): 928.146

                       BAG 1           BAG 2            BAG 3
                    AIR    EX       AIR     EX       AIR     EX

TIME (SECS)           505.4           868.6            505.2
BLOWER REVS           7818            13435            7815
CO  (PPM)          9.10  270.00    7.50     8.00    1.50    13.20
HC  (PPM C)        9.7 6   70.36   6.40    21.00    6.64    52.84
NOX (PPM)          0.85   36.37    0.49     6.14    0.59    19.30
CO2 (%)            0.04    3.10    0.06     1.60    0.06     2.18

                  *** CALCULATED RESULTS ***

                  BAG  1           BAG 2           BAG 3

VMIX (CF)         2075.64          3566.93         2074.85
DF                4.27813          8.36001         6.12841

CORRECTED CONCENTRATIONS

NOX (PPM)           35.7 2            5.71           18.81
HC  (PPM C)         62.88            15.37           47.28
CO  (PPM)          244.79             1.14           11.29
CO2 (%)              3.07             1.55            2.13

MASS EMISSIONS  (GRAMS/BAG)

NOX                  3.28             0.90            1.73
HC                   2.13             0.90            1.60
CO                  16.75             0.13            0.77
CO2               3322.41          2877.99         2304.50

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.44
HC                   0.36
CO                   1.04
CO2               7 49.36

FUEL ECONOMY  (MILES/GAL)

EPAMPG              11.52
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                    ****** CVS 374 ******

                    *** IDENTIFICATION ***

TEST DATE: 4-12-76                ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: MIKE K
MATERIAL: GEM 69-52-A/B           TEST MILES: 7049 VM

COMMENTS:        NO INSULATION ON MANIFOLDS  3912 CC = 10.73 MPG
                 CARBURETOR UNCHANGE FROM PREVIOUS TEST

                       *** TEST DATA ***

TEMP: 53   F (WET)                PRES: 756.985  MM HG (BARO)
      75   F (DRY)                      22.243  MM HG (VAPOR)
      100  F (MIX)                      23.7125  IN. H20 (INLET)
RH:  18  %                              19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2985
BLOWER RPM (ACT): 928.184         BLOWER RPM (CAL): 928.631

                      BAG 1           BAG 2           BAG 3
                   AIR     EX      AIR     EX      AIR     EX

TIME (SECS)           504.8           869.6           505.4
BLOWER REVS           7809            13453           7818
CO  (PPM)          1.40  325.00    1.20     1.50   1.00     7.20
HC  (PPM C)        5.44   77.00    5.72    23.28   5.16    42.40
NOX (PPM)          0.90   57.55    0.89     9.32   0.60    30.12
CO2 (%)            0.06    2.86    0.07     1.75   0.06     2.47

                   *** CALCULATED RESULTS ***

                 BAG 1            BAG 2             BAG 3

VMIX (CF)        2060.97          3550.55           2063.35
DF               4. 62352         7.64634           5.41431

CORRECTED CONCENTRATIONS

NOX (PPM)          56.84             8.55             29.63
HC  (PPM C)        72.74            18.31             38.19
CO  (PPM)         304.13             0.40              6.01
CO2 (%)             2.81             1.69              2.42

MASS EMISSIONS  (GRAMS/BAG)

NOX                 5.10             1.32              2.66
HC                  2.45             1.06              1.29
CO                 20.67             0.05              0.41
CO2              3023.38          3127.66           2605.17

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.67
HC                  0.38
CO                  1.22
CO2              7 88.36

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.19
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                    ****** CVS 877 ******

                    *** IDENTIFICATION ***

TEST DATE: 4-13-7 6                 ROAD TEST: NA
VEHICLE:   ETV 24                   DRIVER: MIKE E
MATERIAL:  GEM 69 - 52 A/B         TEST MILES: 7061 VM

COMMENTS:         CHOKE SET RICHER - TRYING FOR 3 % - NO OTHER
                  CHANGES TOO VEHICLE      3881 CC = 10.82 M.P.G.

                       *** TEST DATA ***

TEMP: 57   F (WET)                  PRES: 752.385  MM HG (BARO)
      78   F (DRY)                         24.617  MM HG (VAPOR)
      101  F (MIX)                         23.625  IN. H20 (INLET)
RH:  24  %                                 19.1625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .2982
BLOWER RPM (ACT): 928.768           BLOWER RPM (CAL): 928.684

                     BAG 1             BAG 2             BAG 3
                   AIR    EX        AIR      EX        AIR      EX

TIME (SECS)          505               867               506.1
BLOWER REVS          7818              13420             7834
CO  (PPM)         1.00  435.00      3.00     4.00     2.00     3.00
HC  (PPM C)       5.96   68.56      6.88    26.24     4.76    36.28
NOX (PPM)         0.91   57.30      1.27    10.20     0.67    31.60
CO2 (%)           0.06    2.90      0.08     1.82     0.05     2.48

                   *** CALCULATED RESULTS ***

                  BAG  1            BAG 2            BAG 3

VMIX (CF)         2044.6           3509.66          2048.78
DF                4.54609          7.35049          5.39472

CORRECTED CONCENTRATIONS

NOX (PPM)          56.59              9.10            31.05
HC  (PPM C)        63.91             20.30            32.40
CO  (PPM)         406.57              1.26             1.22
CO2 (%)             2.85              1.75             2.44

MASS EMISSIONS  (G RAMS/BAG)

NOX                 5.26              1.45             2.89
HC                  2.13              1.16             1.08
CO                 27.41              0.15             0.08
CO2              3042.25           3204.62          2606.21

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.72
HC                  0.36
CO                  1.60
CO2               7 99.78

FUEL ECONOMY  (MILES/GAL)
                                          214<
EPAMPG             11.05
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3

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                    ****** CVS 879 ******

                   *** IDENTIFICATION ***

TEST DATE: 4-14-76              ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: MIKE K
MATERIAL: GEM 69-52-A/B        TEST MILES: 7075 VM

COMMENTS:       SAME AS YESTERDAY
                3829 CC = 10.97 MPG.

                      *** TEST DATA ***

TEMP: 54   F (WET)             PRES: 748.835  MM HG (BARO)
      74   F (DRY)                   21.453  MM HG (VAPOR)
      105   F  (MIX)                  23.625  IN. H20 (INLET)
RH:  23  %                           19.25  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .2985
BLOWER RPM (ACT): 928.596      BLOWER RPM (CAL): 928.675

                        BAG 1          BAG 2           BAG 3
                      AIR    EX      AIR    EX       AIR    EX

TIME (SECS)            505.2          868.8            506
BLOWER REVS            7820           13444            7832
CO  (PPM)           4.60  529.00   7.20     7.50   5.40     7.10
HC  (PPM C)         7.16   89.36   8.36    27.28   6.80    41.80
NOX (PPM)           0.52   58.71   0.88     9.91   0.58    29.63
CO2 (%)             0.05    2.88   0.05     1.80   0.05     2.43

                  *** CALCULATED RESULTS ***

                    BAG 1          BAG 2           BAG 3

VMIX (CF)          2023.06        3478.01         2026.16
DF                 4.56013        7.43022         5.50342

CORRECTED CONCENTRATIONS

NOX (PPM)            58.30          9.15           29.16
HC  (PPM C)          83.7 7        20.05           36.24
CO  (PPM)           492.18          1.00            2.33
CO2 (%)               2.84          1.76            2.39

MASS EMISSIONS  (G RAMS/BAG)

NOX                   5.25          1.42            2.63
HC                    2.77          1.14            1.20
CO                   32.83          0.11            0.16
CO2                2997 .29       3186.32         2524.41

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.69
HC                    0.40
CO                    1.91
CO2                 788.54

FUEL ECONOMY  (MILES/GAL)

EPAMPG               11.22
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                    ****** CVS 917 ******

                   *** IDENTIFICATION ***

TEST DATE: 5-17-76              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: BOB
MATERIAL: GEM NONE              TEST MILES: 7750VM

COMMENTS:        HOT START  W/EGR  INLET TRACE
                 NEW CARB  PORT LINERS  W/O INSULATION  3696CC=11.36MPG

                      *** TEST DATA ***

TEMP: 63   F (WET)              PRES: 738.685  MM HG (BARO)
      71   F (DRY)                    19.468  MM HG (VAPOR)
      105  F (MIX)                    22.75  IN. H20 (INLET)
RH:  64  %                            18.375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2969
BLOWER RPM (ACT): 926.847       BLOWER RPM (CAL): 928.851

                    BAG 1             BAG 2             BAG 3
                  AIR    EX        AIR    EX         AIR    EX

TIME (SECS)         510.6            867.2             505.1
BLOWER REVS         7899             13410             7777
CO  (PPM)        1.00 2900.00    12.10 1310.00     6.30 1524.00
HC  (PPM C)     10.00  340.36    10.80  254.36    12.52  329.76
NOX (PPM)        0.7 0   38.64    0.68    16.40    0.62    41.17
CO2 (%)          0.04    2.54    0.04     1.59    0.04     2.37

                  *** CALCULATED RESULTS ***

                BAG 1           BAG 2            BAG 3

VMIX (CF)       2007. 91        3408.8           1976.9
DF              4.7 119         7.7024           5.26466

CORRECTED CONCENTRATIONS

NOX (PPM)          38.09           15.81            40.67
HC  (PPM C)       332.48          244.96           319.62
CO  (PPM)        2697.48         1232.51          1417.97
CO2 (%)             2.51            1.56             2.34

MASS EMISSIONS  (GRAMS/BAG)

NOX                 4.13            2.91             4.35
HC                 10.90           13.64            10.32
CO                178.58          138.52            92.42
CO2              2626.71         2764.65          2409.96

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.96
HC                  3.23
CO                 35.73
CO2               702.37

FUEL ECONOMY  (MILES/GAL)
                                      216<
EPAMPG             11.51
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                    ****** CVS 918 ******

                   *** IDENTIFICATION ***

TEST DATE: 5-17-76              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: MIKE E
MATERIAL: G EM NONE             TEST MILES: 7762

COMMENTS:         HOT START W/O EGR  INLET TRACE
                  NEW CARB. PORT LINERS W/O INSUL.  3363 CC = 12.49 MPG.

                      *** TEST DATA ***

TEMP: 64   F (WET)              PRES: 738.685  MM HG (BARO)
      74   F (DRY)                    21.453  MM HG (VAPOR)
      105   F (MIX)                   22.75  IN. H20 (INLET)
RH:  58  %                            18.2875  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2968
BLOWER RPM (ACT): 926.921       BLOWER RPM (CAL): 928.86

                      BAG 1          BAG 2           BAG 3
                    AIR    EX      AIR    EX       AIR    EX

TIME (SECS)           503.5          867.9           504.1
BLOWER REVS           7790           13391           7793
CO  (PPM)          1.00 1467.00  14.70 1514.00  25.80 1503.00
HC  (PPM C)       10.88  367.84  12.72  259.64  13.96  297.56
NOX (PPM)          0.58  137.00   1.43   37.78   1.03  122.00
CO2 (%)            0.04    2.24   0.04    1.41   0.04    2.10

                   *** CALCULATED RESULTS ***

                  BAG 1          BAG 2          BAG 3

VMIX (CF)         1979.44        3402.65        1980.2
DF                5.55C01        8.47877        5.90006

CORRECTED CONCENTRATIONS

NOX (PPM)         136.52          36.52         121.14
HC  (PPM C)       358.92         248.42         285.97
CO  (PPM)        1375.46        1431.82        1393.06
CO2 (%)             2.21           1.37           2.07

MASS EMISSIONS  (GRAMS/BAG)

NOX                14.60           6.71          12.96
HC                 11.60          13.80           9.25
CO                 89.77         160.63          90.95
CO2              2276.45        2439.41        2134.31

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 2.72
HC                  3.21
CO                 33.48
CO2               618.09

FUEL ECONOMY  (MILES/GAL)

EPAMPG             13.14
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                    ****** CVS 920 ******

                   *** IDENTIFICATION ***

TEST DATE: 5-18-76              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: MIKE K
MATERIAL: GEM 69-52 A/B         TEST MILES: 7782VM

COMMENTS:       W/O EGR
                HOT START CVS

                     *** TEST DATA ***

TEMP: 59   F (WET)              PRES: 743.185  MM HG (BARO)
      78   F (DRY)                    24.617  MM HG (VAPOR)
      75   F (MIX)                    25.55  IN. H20 (INLET)
RH:  30  %                            21  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3038
BLOWER RPM (ACT): 928.245       BLOWER RPM (CAL): 928.305

                    BAG 1           BAG 2           BAG 3
                  AIR    EX       AIR    EX       AIR    EX

TIME (SECS)         504.6           868.3           506
BLOWER REVS         7807            13432           7829
CO  (PPM)         4.80   5.00     1.70   2.00     1.00    5.70
HC  (PPM C)      13.56  46.16    12.72  39.68    10.12   50.08
NOX (PPM)         0.61  80.26     1.02  28.51     0.73  106.00
CO2 (%)           0.04   2.22     0.05   1.52     0.06    2.20

                  *** CALCULATED RESULTS ***

                  BAG 1           BAG 2           BAG 3

VMIX (CF)         2142.31         3685.86         2148.35
DF                6.09223         8.79173         6.07559

CORRECTED CONCENTRATIONS

NOX (PPM)          79.75           27.61           105.39
HC  (PPM C)        34.85           28.41            41.63
CO  (PPM)           0.77            0.43             4.58
CO2 (%)             2.19            1.48             2.15

MASS EMISSIONS  (GRAMS/BAG)

NOX                 8.06            4.80            10.69
HC                  1.22            1.71             1.46
CO                  0.05            0.05             0.32
CO2              2442.95         2836.53          2408.64

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.91
HC                  0.41
CO                  0.03
CO2               701.32

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.79
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218<

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                    ****** CVS 921 ******

                   *** IDENTIFICATION ***

TEST DATE: 5-18-76               ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: MIKE K
MATERIAL:  GEM 69-52 A/B         TEST MILES: 7793VM

COMMENTS:      W/EGR
               1ST AND 3RD BAG THE SAME

                      *** TEST DATA ***

TEMP: 58   F (WET)               PRES: 743.185  MM HG (BARO)
      78   F (DRY)                     24.617  MM HG (VAPOR)
      105  F (MIX)                     22.4  IN. H20 (INLET)
RH:  27  %                             18.1125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2957
BLOWER RPM (ACT): 928.733        BLOWER RPM (CAL): 928.913

                     BAG 1            BAG 2            BAG 3
                   AIR    EX        AIR    EX        AIR    EX

TIME (SECS)          507.1            868.3            507.1
BLOWER REVS          7849             13441            7849
CO  (PPM)         1.00   11.70     2.20    0.00     1.00   11.70
HC  (PPM C)       9.24   61.12    10.16   42.08     9.24   61.12
NOX (PPM)         0.55   31.96     0.46   13.70     0.55   31.96
CO2 (%)           0.06    2.58     0.04    1.79     0.06    2.58

                  *** CALCULATED RESULTS ***

                BAG 1            BAG 2            BAG 3

VMIX (CF)      2001.85          3428.06          2001.85
DF             5.17932          7.46848          5.17932

CORRECTED CONCENTRATIONS

NOX (PPM)        31.52            13.30            31.52
HC  (PPM C)      53.66            33.28            53.66
CO  (PPM)        10.22            -1.89            10.22
CO2 (%)           2.53             1.76             2.53

MASS EMISSIONS  (GRAMS/BAG)

NOX               2.93             2.11             2.93
HC                1.75             1.86             1.75
CO                0.67            -0.21             0.67
CO2            2642.88          3138.10          2642.88

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.67
HC                0.48
CO                0.06
CO2             770.80

FUEL ECONOMY  (MILES/GAL)

EPAMPG           11.67
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                         ****** CVS 922 ******

                        *** IDENTIFICATION ***

TEST DATE: 5-19-76                 ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: MIKE K
MATERIAL: GEM 69-52-A/B            TEST MILES: 7839 VM

COMMENTS:        HOT START CVS  W/EGR W/O INSUL.
                 PORT LINERS 3594 CC = 11.68 MPG.

                          *** TEST DATA ***

TEMP: 54  F (WET)                  PRES: 744.085  MM HG (BARO)
      70  F (DRY)                        18.765  MM HG (VAPOR)
      104  F (MIX)                       22.75  IN. H20 (INLET)
RH:  33  %                               18.2  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2963
BLOWER RPM (ACT): 923.984          BLOWER RPM (CAL): 928.869

                      BAG 1            BAG 2             BAG 3
                   AIR     EX       AIR     EX        AIR     EX

TIME (SECS)           506.2            868.9             505.6
BLOWER REVS           7839             13452             7828
CO  (PPM)          1.7 0   12.40    1.00    2.00      1.90    2.00
HC  (PPM C)        6.68   42.32     6.80   36.32      6.28   49.56
NOX (PPM)          0.43   24.20     0.70   11.30      0.45   30.21
CO2 (%)            0.04    2.68     0.05    1.73      0.04    2.51

                      *** CALCULATED RESULTS ***

                   BAG 1            BAG 2             BAG 3

VMIX (CF)          2007.33          3444.64           2004.51
DF                 4.98996          7.72858           5.32773

CORRECTED CONCENTRATIONS

NOX (PPM)          23.86            10.69             29.84
HC  (PPM C)        36.98            30.40             44.46
CO  (PPM)          10.28             1.05              0.36
CO2 (%)             2.65             1.69              2.48

MASS EMISSIONS  (G RAMS/BAG)

NOX                 2.20             1.69              2.74
HC                  1.21             1.71              1.46
CO                  0.68             0.12              0.02
CO2               2772.00          3029.54           2589.87

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.56
HC                  0.41
CO                  0.06
CO2               759.70

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.72
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                    ****** CVS 923 ******

                   *** IDENTIFICATION ***

TEST DATE: 5-21-76                ROAD TEST: NA
VEHICLE:   ETV 24                 DRIVER: MIKE K
MATERIAL: GEM 69-52-A/B           TEST MILES: 7850 VM.

COMMENTS:      HOT CVS 3RD BAG RESULTS WERE RUN OVER THE NUMBERS ARE
               FROM THE 2ND RUN  3649 CC = 11.51 MPG.

                     *** TEST DATA ***

TEMP: 57   F (WET)                PRES: 744.585  MM HG (BARO)
      69   F (DRY)                      18.197  MM HG (VAPOR)
      105   F (MIX)                     22.925  IN. H20 (INLET)
RH:  47  %                              18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2969
BLOWER RPM (ACT): 3448.7          BLOWER RPM (CAL): 928.825

                    BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)         505.1            868.5           -867.2
BLOWER REVS         7821             13446            7840
CO  (PPM)        6.00     7.00    2.30     3.00    1.00     2.00
HC  (PPM C)      7.20    48.56    6.88    36.36    6.20    72.56
NOX (PPM)        0.50    25.98    0.77    10.00    0.46    29.46
CO2 (%)          0.04     2.75    0.05     1.79    0.04     2.67

                  *** CALCULATED RESULTS ***

                 BAG 1           BAG 2           BAG 3

VMIX (CF)       2003.44         3444.35         2008.31
DF              4.86299         7.46967         5.00478

CORRECTED CONCENTRATIONS

NOX (PPM)         25.58            9.33           29.09
HC  (PPM C)       42.84           30.40           67.60
CO  (PPM)          1.83            0.89            1.08
CO2 (%)            2.72            1.75            2.64

MASS EMISSIONS  (G RAMS/BAG)

NOX                2.49            1.56            2.84
HC                 1.40            1.71            2.22
CO                 0.12            0.10            0.07
CO2             2839.99         3137.47         2762.86

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.57
HC                 0.48
CO                 0.03
CO2              791.13

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.25
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                    ****** CVS 925 ******

                   *** IDENTIFICATION ***

TEST DATE: 5-25-76              ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: MIKE K
MATERIAL: G EM 69-52-A/B         TEST MILES: 7879

COMMENTS:        PORT LINERS  W/EGR    NO PASSENGER  PORT AIR
                 3844 CC = 10.92 MPG.

                     *** TEST DATA ***

TEMP: 59   F (WET)              PRES: 743.185  MM HG (BARO)
      74   F (DRY)                    21.453  MM HG (VAPOR)
      100   F (MIX)                   22.925  IN. H20 (INLET)
RH:  39  %                            18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2970
BLOWER RPM (ACT): 928.998       BLOWER RPM (CAL): 928.825

                      BAG 1          BAG 2          BAG 3
                   AIR    EX      AIR    EX      AIR    EX

TIME (SECS)          505.7          868.8          506.3
BLOWER REVS          7831           13452          7838
CO  (PPM)         1.00  457.00   4.40   11.20   1.10    6.60
HC  (PPM C)       7 .72  183.00   8.92   37.52   7.40   50.08
NOX (PPM)         0.55   34.50   0.77   10.60   0.64   23.50
CO2 (%)           0.04    3.02   0.06    1.82   0.06    2.42

                  *** CALCULATED RESULTS ***

                   BAG 1          BAG 2          BAG 3

VMIX (CF)          2020.6         3470.97        2022.41
DF                 4.34957        7.3432         5.52434

CORRECTED CONCENTRATIONS

NOX (PPM)           34.08           9.93          22.98
HC  (PPM C)        177 .05         29.81           44.02
CO  (PPM)          423.92           6.91           5.32
CO2 (%)              2.99           1.77           2.37

MASS EMISSIONS  (GRAMS/BAG)

NOX                  3.33           1.67           2.25
HC                   5.84           1.69           1.45
CO                  28.24           0.79           0.35
CO2               3149.85        3200.59        2500.52

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.58
HC                   0.67
CO                   1.75
CO2                797.38

FUEL ECONOMY  (MILES/GAL)

EPAMPG              11.04
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                         ****** CVS 927 ******

                        *** IDENTIFICATION ***

TEST DATE: 5-26-76                ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: MIKE K
MATERIAL: GEM 69-52-A/B           TEST MILES: 7890 VM

COMMENTS:          CHOKED WAS LEANED OUT AND COLD IDLE SPEED WAS DROP
                   3851 CC = 10.90 MPG.  NO PASSENGER PORT AIR

                          *** TEST DATA ***

TEMP: 58   F (WET)                PRES: 747.585  MM HG (BARO)
      70   F (DRY)                      18.765  MM HG (VAPOR)
      100   F (MIX)                     22.75  IN. H20 (INLET)
RH:  48  %                              18.2  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2960
BLOWER RPM (ACT): 928.822         BLOWER RPM (CAL): 928.869

                       BAG 1           BAG 2            BAG 3
                     AIR    EX       AIR    EX        AIR    EX

TIME (SECS)            506             868              505.8
BLOWER REVS            7834            13437            7829
CO  (PPM)          1.00  713.00    1.00    2.00    1.00    1.30
HC  (PPM C)        5.16  267.16    6.52   35.88    5.00   47.56
NOX (PPM)          0.43   47.78    0.55   10.20    0.42   27.21
CO2 (%)            0.04    2.99    0.05    1.84    0.06    2.42

                      *** CALCULATED RESULTS ***

                   BAG 1           BAG 2           BAG 3

VMIX (CF)          2028.64         3479.55         2027.34
DF                 4.34669         7.26769         5.52605

CORRECTED CONCENTRATIONS

NOX (PPM)            47.45            9.73           26.87
HC  (PPM C)        263.19            30.26           43.46
CO  (PPM)          660.15             1.05            0.41
CO2 (%)              2.96             1.80            2.37

MASS EMISSIONS  (GRAMS/BAG)

NOX                  4.73            1.66            2.67
HC                   8.72             1.72            1.44
CO                  44.15            0.12            0.03
CO2               3130.64         3260.59         2506.61

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.70
HC                   0.84
CO                   2.55
CO2                804.74

FUEL ECONOMY  (MILES/GAL)

EPAMPG              10.94
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                         ****** CVS 928 ******

                         *** IDENTIFICATION ***

TEST DATE: 5-27-76                  ROAD TEST: NA
VEHICLE:   ETV 24                   DRIVER: MIKE K
MATERIAL:  GEM 6 9-52-A/B            TEST MILES: 7902 VM

COMMENTS:          NO  COM.      NO PASSENGER PORT AIR
                   3832 CC = 10.96 MPG.

                           *** TEST DATA ***

TEMP: 58   F (WET)                  PRES: 750.985  MM HG (BARO)
      70   F (DRY)                        18.765  MM HG (VAPOR)
      95   F (MIX)                        23.1   IN. H20 (INLET)
RH:  48  %                                18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .2966
BLOWER RPM (ACT): 928.918           BLOWER RPM (CAL): 928.807

                      BAG 1            BAG 2            BAG 3
                    AIR    EX        AIR    EX        AIR    EX

TIME (SECS)           505.9            868.1            505.8
BLOWER REVS           7833             13440            7830
CO  (PPM)          1.00  465.00     5.20    7.10     1.00    5.40
HC  (PPM C)        5.08  162.00     5.68   34.04     4.48   43.16
NOX (PPM)          0.46   33.69     0.55    9.79     0.39   26.39
CO2 (%)            0.06    2.86     0.05    1.80     0.07    2.44

                       *** CALCULATED RESULTS ***

                    BAG 1            BAG 2            BAG 3

VMIX (CF)          2058.73          3532.41          2057.94
DF                 4.58995          7.42762          5.48097

CORRECTED CONCENTRATIONS

NOX (PPM)            33.33             9.31            26.07
HC  (PPM C)         158.03            29.12            39.50
CO  (PPM)           431.42             2.31             4.26
CO2 (%)               2.81             1.76             2.38

MASS EMISSIONS  (GRAMS/BAG)

NOX                   3.36             1.61             2.63
HC                    5.31             1.68             1.33
CO                   29.28             0.27             0.29
CO2                3020.20          3236.17          2557.23

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.61
HC                    0.63
CO                    1.74
CO2                 7 99.00

FUEL ECONOMY  (MILES/G AL)

EPAMPG               11.08
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                    ****** CVS 930 ******

                    *** IDENTIFICATION ***

TEST DATE: 5-28-7 6               ROAD TEST: NA
VEHICLE:   ETV 24                 DRIVER: MIKE K
MATERIAL:  GEM 69-52 A/B          TEST MILES: 7913VM

COMMENTS:        NO CHANGE FROM PREVIOUS TEST   TRACED P-IN
                 WEIGHTED FUEL  3778CC=11.1MPG  NO PASSENGER
                                                 PORT AIR
                      *** TEST DATA ***

TEMP: 64   F (WET)                PRES: 745.885  MM HG (BARO)
      83   F  (DRY)                      28.847  MM HG (VAPOR)
      100   F (MIX)                     23.1875  IN. H20 (INLET)
RH:  31  %                              18.6375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2974
BLOWER RPM (ACT): 928.671         BLOWER RPM (CAL): 928.781

                   BAG 1            BAG 2            BAG 3
                 AIR    EX        AIR    EX        AIR    EX

TIME (SECS)        506.1            868.6            505.6
BLOWER REVS        7829             13446            7828
CO  (PPM)       0.00  435.00     0.70    0.00     0.00   12.90
HC  (PPM C)     5.80  162.08     6.32   37.60     6.28   64.00
NOX (PPM)       0.35   35.60     0.55    9.90     0.40   25.00
CO2 (%)         0.04    2.90     0.06    1.71     0.06    2.50

                  *** CALCULATED RESULTS ***

                 BAG 1           BAG 2            BAG 3

VMIX (CF)       2029.19         3485.06          2028.94
DF              4.53186         7.81906          5.34372

CORRECTED CONCENTRATIONS

NOX (PPM)        35.33            9.42             24.67
HC  (PPM C)     157.56           32.09             58.90
CO  (PPM)       406.36           -0.60             12.15
CO2 (%)           2.87            1.66              2.45

MASS EMISSIONS  (GRAMS/BAG)

NOX               3.52            1.61              2.45
HC                5.22            1.83              1.95
CO               27.19           -0.07              0.81
CO2            3035.86         3012.75           2593.62

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.60
HC                0.6 9
CO                1.61
CO2             7 72.87

FUEL ECONOMY  (MILES/GAL)

EPAMPG           11.30
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                    ****** CVS 931 ******

                   *** IDENTIFICATION ***

TEST DATE: 6-1-76                ROAD TEST: NA
VEHICLE:  ETV 24                 DRIVER: MIKE K
MATERIAL: GEM 69-52-A/B         TEST MILES: 7925 VM

COMMENTS:        PORT AIR IS WORKING ON BOTH SIDES  3901 CC = 10.76 MFG.
                 FIRST TIME CAR RUN IN FOUR DAYS

                      *** TEST DATA ***

TEMP: 67  F (WET)               PRES: 741.685  MM HG (BARO)
      74  F (DRY)                      21.453  MM HG (VAPOR)
     105  F (MIX)                      22.575  IN. H20 (INLET)
RH:  69  %                             18.025  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2960
BLOWER RPM (ACT): 924.572       BLOWER RPM (CAL): 928.904

                   BAG 1            BAG 2            BAG 3
                AIR     EX       AIR     EX       AIR     EX

TIME (SECS)        505.6            868.3            506.3
BLOWER REVS        7800             13421            7752
CO  (PPM)       1.00  275.00    2.00     4.40    1.00    15.90
HC  (PPM C)     5.44  136.40    6.50    37.32    8.48    54.48
NOX (PPM)       0.28   32.11    0.50     8.17    0.22    24.00
CO2 (%)         0.04    3.14    0.06     1.88    0.04     2.75

                  *** CALCULATED RESULTS ***

               BAG 1           BAG 2           BAG 3

VMIX (CF)     1985.87         3416.98         1973.65
DF            4.21534         7.11197         4.8605

CORRECTED CONCENTRATIONS

NOX (PPM)       31.90            7.74           23.83
HC  (PPM C)    132.25           31.65           47.74
CO  (PPM)      251.50            2.46           13.93
CO2 (%)          3.11            1.83            2.72

MASS EMISSIONS  (GRAMS/BAG)

NOX              3.66            1.53            2.72
HC               4.29            1.77            1.54
CO              16.47            0.28            0.91
CO2           3220.29         3258.19         2797.77

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX              0.62
HC               0.60
CO               1.05
CO2            831.69

FUEL ECONOMY  (MILES/GAL)

EPAMPG          10.56
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                          ****** CVS 934 ******

                         *** IDENTIFICATION ***

TEST DATE: 6 -2-76                    ROAD TEST: NA
VEHICLE:   ETV 24                    DRIVER: MIKE K
MATERIAL: G EM 6 9-52-A/B              TEST MILES: 7936 VM

COMMENTS:        PORT LINERS W/O INSUL.
                 3760 CC = 11.17 MPG.

                           *** TEST DATA ***

TEMP: 62   F (W ET)                   PRES: 746.985  MM HG (BARO)
      76   F (DRY)                          22.922  MM HG (VAPOR)
      90   F (MIX)                          23.1   IN. H20 (INLET)
RH:  44  %                                  18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                BLOWER SPEED:  3
FUEL: HO III                         CF/REV: .2969
BLOWER RPM (ACT): 928.92             BLOWER RPM (CAL): 928.807

                     BAG 1              BAG 2              BAG 3
                  AIR     EX         AIR     EX         AIR      EX

TIME (SECS)          506.8             869.2              504.7
BLOWER REVS          7848              13455              7814
CO  (PPM)        1.00  355.00     1.50     2.00     1.00     9.80
HC  (PPM C)      4.60  145.96     4.96    35.56     4.84    51.96
NOX (PPM)        0.34   43.53     0.47     9.75     0.37    28.96
CO2 (%)          0.04    2.94     0.06     1.76     0.05     2.50

                       *** CALCULATED RESULTS ***

                 BAG 1              BAG 2              BAG 3

VMIX (CF)        2071.78            3551.96            2062.8
DF               4.48523            7.59746            5.34692

CORRECTED CONCENTRATIONS

NOX (PPM)          43.27               9.34              28.66
HC  (PPM C)       142.39              31.25              48.03
CO  (PPM)         329.10               0.62               8.39
CO2 (%)             2.91               1.71               2.46

MASS EMISSIONS  (GRAMS/BAG)

NOX                 4.53               1.68               2.98
HC                  4.82               1.81               1.62
CO                 22.48               0.07               0.57
CO2              3142.89            3163.62            2645.65

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.71
HC                  0.64
CO                  1.34
CO2               803.08

FUEL ECONOMY  (MILES/GAL)              227<

EPAMPG             10.93
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                  ****** CVS 935 ******

                 *** IDENTIFICATION ***

TEST DATE: 6-3-76                ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: MIKE K
MATERIAL: G EM 69-52-A/B          TEST MILES: 7948 VM

COMMENTS:        RICHEN UP CHOKE
                 3776 CC = 11.12 MPG.

                   *** TEST DATA ***

TEMP: 60   F (WET)               PRES: 749.235  MM HG (BARO)
      73   F (DRY)                     20.815  MM HG (VAPOR)
      95   F (MIX)                     23.1  IN. H20 (INLET)
RH:  45  %                             18.6375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2970
BLOWER RPM (ACT): 928.842        BLOWER RPM (CAL): 928.79

                    BAG 1           BAG 2           BAG 3
                  AIR    EX       AIR    EX       AIR    EX

TIME (SECS)         505.5           869             506.1
BLOWER REVS         7825           13453            7835
CO  (PPM)        1.00  256.00   1.60    7.00   1.00    5.50
HC  (PPM C)      5.04  129.16   5.16   34.52   4.72   53.12
NOX (PPM)        0.31   40.30   0.48    8.87   0.28   31.07
CO2 (%)          0.04    2.96   0.05    1.77   0.04    2.51

               *** CALCULATED RESULTS ***

                 BAG 1           BAG 2           BAG 3

VMIX (CF)       2054.03         3531.36         2056.65
DF              4.47161         7.55305         5.32628

CORRECTED CONCENTRATIONS

NOX (PPM)        40.06            8.45           30.84
HC  (PPM C)     125.25           30.04           49.29
CO  (PPM)       236.93            5.29            4.35
CO2 (%)           2.93            1.73            2.48

MASS EMISSIONS  (GRAMS/BAG)

NOX               4.07            1.48            3.14
HC                4.20            1.73            1.66
CO               16.05            0.62            0.30
CO2             3137.42         3179.75         2657.24

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.67
HC                0.60
CO                1.02
CO2             805.80

FUEL ECONOMY  (MILES/GAL)

EPAMPG           10.91
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                    ****** CVS 937 ******

                   *** IDENTIFICATION ***

TEST DATE: 6-4-76                 ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: MIKE K
MATERIAL: GEM 69-53A/B            TEST MILES: 7960VM

COMMENTS:          RICHER CHOKE THAN PREVIOUS TEST IS ONLY
                   CHANGE TO ENGINE    3769CC = 11.14MMPG

                     *** TEST DATA ***

TEMP: 61   F (WET)                PRES: 752.885  MM HG (BARO)
      74   F (DRY)                      21.453  MM HG (VAPOR)
      97   F (MIX)                      23.1  IN. H20 (INLET)
RH:  47  %                              18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2965
BLOWER RPM (ACT): 928.846         BLOWER RPM (CAL): 928.807

                   BAG 1            BAG 2            BAG 3
                AIR     EX       AIR     EX       AIR     EX

TIME (SECS)       505.4            868.6            505.3
BLOWER REVS       7825             13445            7823
CO  (PPM)      1.00   370.00    1.00     2.00    1.00     2.70
HC  (PPM C)    5.00   174.92    5.76    33.92    5.00    46.40
NOX (PPM)      0.24    37.80    0.47     9.18    0.23    31.41
CO2 (%)        0.03     2.96    0.05     1.72    0.06     2.54

                  *** CALCULATED RESULTS ***

                BAG 1           BAG 2           BAG 3

VMIX (CF)       2053.75         3528.78         2053.23
DF              4.44913         7.77451         5.26545

CORRECTED CONCENTRATIONS

NOX (PPM)        37.61           8.77           31.22
HC  (PPM C)     171.04          28.90           42.35
CO  (PPM)       342.54           1.05            1.73
CO2 (%)           2.94           1.68            2.49

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.89          1.56            3.23
HC                 5.74          1.67            1.42
CO                23.19          0.12            0.12
CO2             3145.35       3085.07         2667.68

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.68
HC                0.66
CO                1.35
CO2             794.42

FUEL ECONOMY  (MILES/GAL)

EPAMPG           10.99
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                         ****** CVS 939 ******

                        *** IDENTIFICATION ***

TEST DATE: 6 -7- 7 6              ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: MIKE K
MATERIAL: G EM 6 9-52-A/B        TEST MILES: 7971 VM

COMMENTS:        CHOKE IS RICHER FROM PREVIOUS TEST
                 3803 CC = 11.04 MPG.

                          *** TEST DATA ***

TEMP: 63   F (WET)              PRES: 748.235  MM HG (BARO)
      78   F (DRY)                    24.617  MM HG (VAPOR)
      110   F (MIX)                   22.4875  IN. H20 (INLET)
RH:  43  %                            17.85  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2951
BLOWER RPM (ACT): 928.998       BLOWER RPM (CAL): 928.931

                      BAG 1          BAG 2          BAG 3
                    AIR    EX      AIR    EX      AIR    EX

TIME (SECS)           506.3          868.2          506.3
BLOWER REVS           7839           13443          7839
CO  (PPM)          3.50  245.00   2.30    3.70   1.00   13.90
HC  (PPM C)        4.96   99.80   6.28   36.60   5.32   59.12
NOX (PPM)          0.82   34.73   0.48    8.99   0.17   30.37
CO2 (%)            0.04    3.06   0.06    1.82   0.05    2.63

                     *** CALCULATED RESULTS ***

                   BAG 1          BAG 2          BAG 3

VMIX (CF)          1991.52        3415.23        1991.52
DF                 4.33279        7.34644        5.08112

CORRECTED CONCENTRATIONS

NOX (PPM)            34.10           8.58          30.23
HC  (PPM C)          95.98          31.17          54.85
CO  (PPM)           224.51           1.56          12.21
CO2 (%)               3.03           1.77           2.59

MASS EMISSIONS  (GRAMS/BAG)

NOX                   3.47           1.50           3.08
HC                    3.12           1.74           1.78
CO                   14.74           0.18           0.80
CO2                3146.10        3149.19        2689.75

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.63
HC                    0.55
CO                    0.93
CO2                 804.69

FUEL ECONOMY  (MILES/GAL)

EPAMPG               10.91
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                    ****** CVS 941 ******

                    *** IDENTIFICATION ***

TEST DATE: 6-8-76               ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: MIKE K
MATERIAL: GEM 69-52 A/B         TEST MILES: 8004VM

COMMENTS:       CHOKE SET AT .220 - NO OTHER
                CHANGES TO VEHICLE      3811CC = 11.02 M.P.G.

                      *** TEST DATA ***

TEMP: 65   F (WET)              PRES: 746.285  MM HG (BARO)
      80   F (DRY)                    26.271  MM HG (VAPOR)
      95   F (MIX)                    23.275  IN. H20 (INLET)
RH:  44  %                            18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2972
BLOWER RPM (ACT): 928.892       BLOWER RPM (CAL): 928.79

                     BAG 1          BAG 2          BAG 3
                   AIR    EX      AIR    EX      AIR    EX

TIME (SECS)          506           868.6          504.8
BLOWER REVS          7835          13445          7816
CO  (PPM)        10.60  490.00  11.90   12.00   6.30   30.00
HC  (PPM C)       7.32  120.56   8.52   36.00   7.84   51.88
NOX (PPM)         0.25   24.90   0.46    8.04   0.26   27.76
CO2 (%)           0.04    2.95   0.06    1.76   0.07    2.67

                  *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)       2048.83        3515.83        2043.86
DF              4.45541        7.59318        5.00375

CORRECTED CONCENTRATIONS

NOX (PPM)         24.71           7.64          27.55
HC  (PPM C)      114.88          28.60          45.61
CO  (PPM)        447.11           1.24          23.06
CO2 (%)            2.92           1.71           2.61

MASS EMISSIONS  (GRAMS/BAG)

NOX                2.66           1.41           2.96
HC                 3.84           1.64           1.52
CO                30.20           0.14           1.55
CO2             3118.82        3131.44        2786.18

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.57
HC                 0.56
CO                 1.87
CO2              808.09

FUEL ECONOMY  (MILES/GAL)

EPAMPG            10.81
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                    ****** CVS 944 ******

                    *** IDENTIFICATION ***

TEST DATE: 6-10-76                 ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: LARRY
MATERIAL:  GEM 69-52-A/B           TEST MILES: 8022

COMMENTS:        PORT LINERS MANIFOLDS INSULATED
                 NO CARB. CHANGES 3771 CC = 11.14 MPG.

                      *** TEST DATA ***

TEMP: 67   F (WET)                 PRES: 744.385  MM HG (BARO)
      83   F (DRY)                        28.847  MM HG (VAPOR)
      90   F (MIX)                        23.0125  IN. H20 (INLET)
RH:  41   %                               18.2875  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2968
BLOWER RPM (ACT): 928.866          BLOWER RPM (CAL): 928.834

                   BAG 1             BAG 2             BAG 3
                AIR     EX        AIR     EX        AIR     EX

TIME (SECS)        505.2             868.6             505.2
BLOWER REVS        7820              13447             7822
CO   (PPM)      3.10  583.00      9.60   10.00      4.70   16.20
HC   (PPM C)    5.76  194.84      8.00   31.92      6.48   53.68
NOX (PPM)       0.24   35.42      0.63    9.02      0.31   15.70
CO2 (%)         0.04    2.82      0.08    1.74      0.05    2.52

                 *** CALCULATED RESULTS ***

                 BAG 1             BAG 2             BAG 3

VMIX (CF)       2056.15           3535.69           2056.68
DF              4.63051           7.68285           5.30297

CORRECTED CONCENTRATIONS

NOX (PPM)         35.23              8.47             15.45
HC   (PPM C)     190.32             24.96             48.42
CO   (PPM)       541.23              1.29             11.44
CO2 (%)            2.79              1.67              2.48

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.84              1.59              1.68
HC                 6.39              1.44              1.63
CO                36.69              0.15              0.78
CO2             2990.21           3080.01           2659.33

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.56
HC                 0.68
CO                 2.18
CO2              784.22

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.17
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                      ****** CVS 946 ******

                      *** IDENTIFICATION ***

TEST DATE: 6-11-76                 ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: LARRY
MATERIAL: GEM 69-52 A/B            TEST MILES: 8035VM

COMMENTS:        W/EGR-W/PORT LINERS-W/INSULATION
                 HOT START   WEIGHTED FUEL=3640CC-11.54MPG

                         *** TEST DATA ***

TEMP: 71   F (WET)                 PRES: 740.685  MM HG (BARO)
      85   F (DRY)                       30.745  MM HG (VAPOR)
      95   F (MIX)                       22.8375  IN. H20 (INLET)
RH:  54  %                               18.375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2969
BLOWER RPM (ACT): 928.929          BLOWER RPM (CAL): 928.843

                      BAG 1          BAG 2          BAG 3
                   AIR    EX      AIR    EX      AIR    EX

TIME (SECS)          506            868.1           506
BLOWER REVS          7834           13441           7833
CO  (PPM)         1.00   12.50   1.00    7.00   1.00   16.30
HC  (PPM C)       5.64   50.08   5.68   30.88   5.36   52.80
NOX (PPM)         0.27   13.65   0.36    6.63   0.25   17.40
CO2 (%)           0.04    2.82   0.05    1.77   0.05    2.67

                   *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)        2032.44        3487.11        2032.18
DF               4.7 414         7.55461        5.00598

CORRECTED CONCENTRATIONS

NOX (PPM)        13.44           6.32          17.20
HC  (PPM C)      45.63          25.95          48.51
CO  (PPM)        10.83           5.79          14.39
CO2 (%)           2.79           1.73           2.63

MASS EMISSIONS  (GRAMS/BAG)

NOX               1.67           1.35           2.14
HC                1.51           1.48           1.61
CO                0.73           0.67           0.96
CO2             2955.51        3139.91        2787.22

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.44
HC                0.41
CO                0.20
CO2             799.93

FUEL ECONOMY  (MILES/GAL)

EPAMPG           11.07
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                    ****** CVS 947 ******

                   *** IDENTIFICATION ***

TEST DATE: 6-11-76              ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: LARRY
MATERIAL: GEM 69-52-A/B         TEST MILES: 8047 VM

COMMENTS:       W/O EGR  W/PORT LINERS  W/INSULATION
                HOT START CVS  3659 CC = 11.48 MPG.

                     *** TEST DATA ***

TEMP: 72  F (WET)               PRES: 740.685  MM HG (BARO)
      87  F (DRY)                      32.934  MM HG (VAPOR)
      95  F (MIX)                      22.8375  IN. H20 (INLET)
RH:  48  %                             18.375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2969
BLOWER RPM (ACT): 928.926       BLOWER RPM (CAL): 928.843

                    BAG 1           BAG 2           BAG 3
                  AIR    EX       AIR    EX       AIR    EX

TIME (SECS)         505.8           869.4           505.1
BLOWER REVS         7831            13461           7819
CO  (PPM)         1.00   2.00     1.00   2.00     1.00   11.90
HC  (PPM C)       4.80   45.56    5.24   30.16    5.24   49.60
NOX (PPM)         0.15   82.16    1.44   19.50    0.69   38.98
CO2 (%)           0.04    2.46    0.07    2.05    0.07    2.60

                  *** CALCULATED RESULTS ***

                  BAG 1           BAG 2           BAG 3

VMIX (CF)         2031.66         3492.3          2028.55
DF                5.43667         6.52638         5.14184

CORRECTED CONCENTRATIONS

NOX (PPM)          82.04           18.28           38.42
HC  (PPM C)        41.64           25.72           45.38
CO  (PPM)           1.07            1.06           10.33
CO2 (%)             2.43            1.99            2.54

MASS EMISSIONS  (GRAMS/BAG)

NOX                 9.95            3.81            4.66
HC                  1.38            1.47            1.50
CO                  0.07            0.12            0.69
CO2              2571.82         3625.58         2690.86

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.43
HC                  0.39
CO                  0.07
CO2               835.37

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.06
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                    ****** CVS 948 ******

                    *** IDENTIFICATION ***

TEST DATE: 6-14-76            ROAD TEST: NA
VEHICLE:   ETV 24             DRIVER: MIKE E
MATERIAL: GEM NONE            TEST MILES: 8061 VM

COMMENTS:      W/O EGR  W/PORT LINERS W/INSUL.
               ROOM TEMP. (HOT)    3343 CC = 12.56 MPH.

                     *** TEST DATA ***

TEMP: 74  F (WET)             PRES: 743.585  MM HG (BARO)
      92  F (DRY)                    38.44  MM HG (VAPOR)
      91  F (MIX)                    23.1  IN. H20 (INLET)
RH:  42  %                           18.55  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS         BLOWER SPEED:  3
FUEL: HO III                  CF/REV: .2973
BLOWER RPM (ACT): 929.029     BLOWER RPM (CAL): 928.798

                    BAG 1          BAG 2          BAG 3
                 AIR    EX      AIR    EX      AIR    EX

TIME (SECS)         505.2          849.6          505.4
BLOWER REVS         7823           13154          7826
CO  (PPM)        1.00 2700.00   1.00 1310.00  14.70 1562.00
HC  (PPM C)      4.80  334.40   6.80  245.24   8.84  334.52
NOX (PPM)        0.35  122.00   0.44   34.11   0.63  114.00
CO2 (%)          0.04    2.22   0.04    1.43   0.06    2.18

                  *** CALCULATED RESULTS ***

                BAG 1          BAG 2          BAG 3

VMIX (CF)       2054.05        3453.79        2054.84
DF              5.34239        8.48026        5.67561

CORRECTED CONCENTRATIONS

NOX (PPM)        121.72          33.72         113.48
HC  (PPM C)      330.50         239.24         327.24
CO  (PPM)       2547.19        1255.30        1463.31
CO2 (%)            2.19           1.39           2.13

MASS EMISSIONS  (GRAMS/BAG)

NOX               15.06           7.02          14.05
HC                11.09          13.49          10.98
CO               172.50         142.94          99.14
CO2             2343.21        2512.10        2283.12

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               2.87
HC                3.27
CO               36.48
CO2             642.81

FUEL ECONOMY  (MILES/GAL)

EPAMPG           12.46
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                    ****** CVS 949 ******

                   *** IDENTIFICATION ***

TEST DATE: 6-14-76             ROAD TEST: NA
VEHICLE:  ETV 24               DRIVER: LARRY
MATERIAL: GEM NONE             TEST MILES: 8072 VM

COMMENTS:      W/EGR - W/PORT LINERS - W/INSULATION - W/O CAT.
               HOT START CVS - ROOM TEMP " HOT " - 3551 CC = 11.83 M.P.G


                      *** TEST DATA ***

TEMP: 75   F (WET)             PRES: 743.485  MM HG (BARO)
      92   F (DRY)                   38.44  MM HG (VAPOR)
      92   F (MIX)                   23.1   IN. H20 (INLET)
RH:  45  %                           18.55  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .2973
BLOWER RPM (ACT): 928.977      BLOWER RPM (CAL): 928.798

                     BAG 1          BAG 2          BAG 3
                   AIR    EX      AIR    EX      AIR    EX

TIME (SECS)          504.8          868.5          505.8
BLOWER REVS          7815           13448          7831
CO  (PPM)         3.20 2950.00  10.50 1535.00  20.40 2800.00
HC  (PPM C)       7.52  338.00  10.40  264.00  11.08  347.40
NOX (PPM)         0.56   31.30   0.72   13.70   0.65   34.06
CO2 (%)           0.06    2.30   0.06    1.50   0.06    2.35

                  *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)       2047.99        3524.17        2052.19
DF              5.13125        8.00843        5.06042

CORRECTED CONCENTRATIONS

NOX (PPM)         30.85          13.07          33.54
HC  (PPM C)      331.95         254.90         338.51
CO  (PPM)       2773.97        1459.31        2616.51
CO2 (%)            2.25           1.45           2.30

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.95           2.88           4.31
HC                11.10          14.67          11.34
CO               187.31         169.56         177.03
CO2             2404.87        2660.28        2463.48

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.94
HC                 3.45
CO                46.80
CO2              679.81

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.61
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                      ****** CVS 950 ******

                     *** IDENTIFICATION ***

TEST DATE: 6-15-76              ROAD TEST: NA
VEHICLE:   ETV 24               DRIVER: MIKE K
MATERIAL:  GEM 69-52 A/B        TEST MILES: 8088 VM

COMMENTS:         W/EGR - HOT START CVS - W/CAT - W/PORT
                  LINERS - W/INSULATION - 3610 CC = 11.63 M.P.G.

                       *** TEST DATA ***

TEMP: 74   F (WET)              PRES: 742.185  MM HG (BARO)
      93   F (DRY)                    39.659  MM HG (VAPOR)
      100  F (MIX)                    22.925  IN. H20 (INLET)
RH:  39  %                            18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2970
BLOWER RPM (ACT): 928.982       BLOWER RPM (CAL): 928.825

                     BAG 1          BAG 2          BAG 3
                  AIR    EX      AIR    EX      AIR    EX

TIME (SECS)         505.7          868.7          505.4
BLOWER REVS         7831           13448          7826
CO  (PPM)         1.00   6.20    1.00   30.70   1.00   69.30
HC  (PPM C)       4.84   47.12   5.24   28.12   5.28   60.92
NOX (PPM)         0.28   12.50   0.30    8.42   0.25   14.30
CO2 (%)           0.04    2.81   0.07    1.82   0.05    2.68

                  *** CALCULATED RESULTS ***

                  BAG 1          BAG 2          BAG 3

VMIX (CF)         2018.24        3465.88        2016.95
DF                4.75972        7.33951        4.97664

CORRECTED CONCENTRATIONS

NOX (PPM)           12.28           8.16          14.10
HC  (PPM C)         43.30          23.59          56.70
CO  (PPM)            5.01          28.38          64.06
CO2 (%)              2.78           1.76           2.64

MASS EMISSIONS  (GRAMS/BAG)

NOX                  1.46           1.67           1.68
HC                   1.43           1.34           1.87
CO                   0.33           3.24           4.26
CO2               2924.30        3180.28        2776.91

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.43
HC                   0.40
CO                   0.78
CO2                802.74

FUEL ECONOMY  (MILES/GAL)

EPAMPG              11.06
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                 ****** CVS 951 ******

                 *** IDENTIFICATION ***

TEST DATE: 6-15-76              ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: MIKE K
MATERIAL: GEM 69-52 A/B         TEST MILES: 8099 VM

COMMENTS:       W/O EGR - HOT START CVS - W/CAT. - W/PORT
                LINERS - W/INSULATION - 3264 CC = 12.87 M.P.G.

                   *** TEST DATA ***

TEMP: 75  F (WET)               PRES: 741.585  MM HG (BARO)
      94  F (DRY)                     40.904  MM HG (VAPOR)
      100  F (MIX)                    22.75  IN. H20 (INLET)
RH:  38  %                            18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2968
BLOWER RPM (ACT): 929.031       BLOWER RPM (CAL): 928.843

                  BAG 1          BAG 2          BAG 3
                AIR    EX      AIR    EX      AIR    EX

TIME (SECS)       505.8          868.3          505.6
BLOWER REVS       7833           13444          7828
CO  (PPM)      1.00   14.70   1.00   26.20   1.00  117.00
HC  (PPM C)    5.16   38.08   5.24   26.92   5.12   52.12
NOX (PPM)      0.18   32.18   0.45   11.50   0.35   30.74
CO2 (%)        0.04    2.44   0.06    1.67   0.05    2.52

                *** CALCULATED RESULTS ***

               BAG 1          BAG 2          BAG 3

VMIX (CF)      2016.55        3461.07        2015.27
DF             5.48014        7.99907        5.26349

CORRECTED CONCENTRATIONS

NOX (PPM)        32.03          11.11          30.46
HC  (PPM C)      33.86          22.34          47.97
CO  (PPM)        13.02          24.17         109.09
CO2 (%)           2.41           1.62           2.48

MASS EMISSIONS  (GRAMS/BAG)

NOX               3.82           2.28           3.63
HC                1.12           1.26           1.58
CO                0.87           2.76           7.25
CO2            2531.59        2919.50        2605.82

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.80
HC                0.35
CO                0.97
CO2             732.45

FUEL ECONOMY  (MILES/GAL)

EPAMPG           12.18
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                          ****** CVS 952 ******

                         *** IDENTIFICATION ***

TEST DATE: 6-16-76                   ROAD TEST: NA
VEHICLE:   ETV 24                    DRIVER: MIKE K
MATERIAL:  GEM 69-52-A/B             TEST MILES: 8111 VM

COMMENTS:        W/O EGR COLD STAART  W/PORT LINERS W/INSUL.
                 W/CAT.     3520 CC = 11.93 MPG.

                            *** TEST DATA ***

TEMP: 74   F (WET)                   PRES: 738.685  MM HG (BARO)
      85   F (DRY)                          30.745  MM HG (VAPOR)
      100  F (MIX)                         22.8375  IN. H20 (INLET)
RH:  61  %                                 18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                BLOWER SPEED:  3
FUEL: HO III                         CF/REV: .2972
BLOWER RPM (ACT): 929.003            BLOWER RPM (CAL): 928.834

                         BAG 1           BAG 2           BAG 3
                      AIR     EX      AIR     EX      AIR     EX

TIME (SECS)             507.8            868            505.7
BLOWER REVS             7862            13440           7830
CO  (PPM)           1.00  597.00    4.10     6.10    1.00     2.00
HC  (PPM C)         4.68  185.12    6.08    33.68    5.36    49.92
NOX (PPM)           0.18   95.67    0.80    14.60    0.41    57.34
CO2 (%)             0.04    2.83    0.04     1.68    0.05     2.38

                        *** CALCULATED RESULTS ***

                    BAG 1            BAG 2             BAG 3

VMIX (CF)          2017.52          3448.93           2009.31
DF                 4.61467          7.9575            5.61803

CORRECTED CONCENTRATIONS

NOX (PPM)            95.53            13.90             57.00
HC  (PPM C)         181.45            28.36             45.51
CO  (PPM)           551.95             2.27              1.06
CO2 (%)               2.80             1.65              2.34

MASS EMISSIONS  (GRAMS/BAG)

NOX                  12.73             3.17              7.56
HC                    5.98             1.60              1.49
CO                   36.71             0.26              0.07
CO2                2944.59          2958.78           2450.83

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   1.73
HC                    0.67
CO                    2.14
CO2                 749.59

FUEL ECONOMY  (MILES/GAL)

EPAMPG               11.67
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                        ****** CVS 954 ******

                       *** IDENTIFICATION ***

TEST DATE: 6-17-76                  ROAD TEST: NA
VEHICLE:  ETV 24                    DRIVER: LARRY
MATERIAL: GEM 69-52-A/B             TEST MILES: 8123 VM

COMMENTS:         W/EGR  W/PORT LIMERS  W/INSUL.  W/CAT.
                  COLD STEART     3809 CC = 11.03 MPG.

                          *** TEST DATA ***

TEMP: 63   F (WET)                  PRES: 746.885  MM HG (BARO)
      77   F (DRY)                        23.756  MM HG (VAPOR)
      110  F (MIX)                        22.4875  IN. H20 (INLET)
RH:  45  %                                18.375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .2959
BLOWER RPM (ACT): 927.72            BLOWER RPM (CAL): 928.878

                     BAG 1             BAG 2             BAG 3
                  AIR     EX        AIR     EX        AIR     EX

TIME (SECS)         504.6              868.9             505.3
BLOWER REVS         7805               13449             7796
CO  (PPM)         1.00  780.00     5.90     5.80     1.00     2.00
HC  (PPM C)       4.68  207.44     6.24    35.36     5.12    50.64
NOX (PPM)         0.29   35.66     0.51     7.99     0.33    19.50
CO2 (%)           0.04    2.99     0.06     1.76     0.06     2.58

                      *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        1984.41          3419.4           1982.13
DF               4.34625          7.59599          5.18325

CORRECTED CONCENTRATIONS

NOX (PPM)         35.44            7.55             19.23
HC  (PPM C)      203.84           29.94             46.51
CO  (PPM)        723.01            0.47              1.08
CO2 (%)            2.96            1.71              2.53

MASS EMISSIONS  (GRAMS/BAG)

NOX                 3.61           1.32              1.96
HC                  6.51           1.67              1.51
CO                 47.30           0.05              0.07
CO2              3062.40        3045.55           2616.84

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.53
HC                  0.72
CO                  2.72
CO2               780.53

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.15
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                         ****** CVS 974 ******

                        *** IDENTIFICATION ***

TEST DATE: 7-6-76                    ROAD TEST: NA
VEHICLE:  ETV 24                     DRIVER: LARRY
MATERIAL: GEM 68-OB/OF               TEST MILES: 2042

COMMENTS:          NO PREP. FOR FOUR DAYS
                   3798 CC = 11.06 MPG.

                          *** TEST DATA ***

TEMP: 69   F (WET)                   PRES: 746.885  MM HG (BARO)
      82   F (DRY)                         28.021  MM HG (VAPOR)
      108   F (MIX)                        22.8375  IN. H20 (INLET)
RH:  48  %                                 18.2875  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                BLOWER SPEED:  3
FUEL: HO III                         CF/REV: .2963
BLOWER RPM (ACT): 929.029            BLOWER RPM (CAL): 928.851

                        BAG 1            BAG 2            BAG 3
                     AIR     EX       AIR     EX       AIR     EX

TIME (SECS)             505.5            868.4            504.9
BLOWER REVS             7827             13447            7817
CO  (PPM)            7.00  501.00     9.50    24.00    5.00    39.70
HC  (PPM C)          5.60  153.72     6.48    33.80    5.48    56.12
NOX (PPM)            0.26   36.24     0.42    10.00    0.22    15.30
CO2 (%)              0.04    2.95     0.06     1.75    0.06     2.57

                      *** CALCULATED RESULTS ***

                    BAG 1            BAG 2            BAG 3

VMIX (CF)          1997.82          3432.3           1995.26
DF                 4.44909          7.63245          5.19516

CORRECTED CONCENTRATIONS

NOX (PPM)           36.04             9.64             15.12
HC  (PPM C)        149.38            28.17             51.69
CO  (PPM)          459.44            14.69             33.15
CO2 (%)              2.92             1.70              2.52

MASS EMISSIONS  (GRAMS/BAG)

NOX                  3.99             1.83              1.67
HC                   4.87             1.58              1.68
CO                  30.26             1.66              2.18
CO2               3041.18          3039.08           2623.75

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.60
HC                   0.62
CO                   2.12
CO2                778.98

FUEL ECONOMY  (MILES/GAL)

EPAMPG              11.21
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                    ****** CVS 975 ******

                    *** IDENTIFICATION ***

TEST DATE:  7-7-76                  ROAD TEST: NA
VEHICLE:   ETV 24                   DRIVER: MIKE K
MATERIAL:  GEM 68-0B/0F             TEST MILES: 2053

COMMENTS:         NO COM.
                  3773 CC = 11.13 MPG.

                      *** TEST DATA ***

TEMP: 68   F (WET)                  PRES: 743.685  MM HG (BARO)
      80   F (DRY)                         26.271  MM HG (VAPOR)
      99   F (MIX)                         23.5375  IN. H20 (INLET)
RH:   54   %                               18.8125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .2963
BLOWER RPM (ACT): 928.948           BLOWER RPM (CAL): 928.728

                      BAG 1            BAG 2            BAG 3
                    AIR     EX       AIR     EX       AIR     EX

TIME (SECS)           505.5            868.2            511.4
BLOWER REVS           7827             13443            7916
CO  (PPM)          6.20  451.00    12.20    34.10    7.00    43.50
HC  (PPM C)        6.36  140.92     8.08    33.88    6.64    70.12
NOX (PPM)          0.32   35.19     0.76     9.96    0.40    14.35
CO2 (%)            0.04    2.91     0.07     1.71    0.07     2.44

                   *** CALCULATED RESULTS ***

                    BAG 1            BAG 2            BAG 3

VMIX (CF)          2030.16          3486.83          2053.24
DF                 4.51805          7.80601          5.46697

CORRECTED CONCENTRATIONS

NOX (PPM)            34.94             9.30            14.02
HC  (PPM C)         135.97            26.84            64.69
CO  (PPM)           413.13            21.93            35.08
CO2 (%)               2.38             1.65             2.38

MASS EMISSIONS  (GRAMS/BAG)

NOX                   4.02             1.84             1.63
HC                    4.51             1.53             2.17
CO                   27.65             2.52             2.37
CO2                3047.92          2998.45          2551.43

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.60
HC                    0.63
CO                    2.10
CO2                 768.45

FUEL ECONOMY  (MILES/GAL)

EPAMPG               11.35
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                        ****** CVS 976 ******

                       *** IDENTIFICATION ***

  TEST DATE:  7-8-76                  ROAD TEST: NA
  VEHICLE:   ETV 24                   DRIVER: MIKE K
  MATERIAL: GEM 68-0E/0F              TEST MILES: 2064

  COMMENTS:        MAN. VAC. DELAY 2 MIN. 15 SEC.
                   3887 CC = 10.80 MPG.

                         *** TEST DATA ***

  TEMP: 70   F (WET)                  PRES: 743.585  MM  HG (BARO)
        81   F (DRY)                         27.055  MM HG (VAPOR)
        100   F (MIX)                        23.5375  IN. H20 (INLET)
  RH:  61  %                                 18.8125  IN. H20 (OUTLET)
  INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
  FUEL: HO III                        CF/REV: .2983
  BLOWER RPM (ACT): 928.969           BLOWER RPM (CAL): 928.728

                       BAG 1            BAG 2             BAG 3
                    AIR     EX       AIR      EX       AIR      EX

  TIME (SECS)          506             868.6              506
  BLOWER REVS          7834            13449              7834
  CO   (PPM)        7.10  433.00    7.90    20.10    5.20    47.80
  HC   (PPM C)      7.04  176.00    7.72    37.36    6.64    56.48
  NOX (PPM)         0.38   21.20    0.43     8.30    0.30    11.35
  CO2 (%)           0.04    3.03    0.07     1.70    0.07     2.51

                     *** CALCULATED RESULTS ***

                  BAG 1           BAG 2           BAG 3

  VMIX (CF)       2028.11         3481.75         2028.11
  DF              4.34005         7.85629         5.31724

  CORRECTED CONCENTRATIONS

  NOX (PPM)        20.91            7.92            11.11
  HC   (PPM C)    170.58           30.62            51.09
  CO   (PPM)      393.86           12.29            40.41
  CO2 (%)           3.00            1.64             2.45

  MASS EMISSIONS  (GRAMS/BAG)

  NOX               2.58            1.68             1.37
  HC                5.65            1.74             1.69
  CO               26.34            1.41             2.70
  CO2            3172.15         2975.82          2594.61

  WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

  NOX               0.48
  HC                0.63
  CO                1.90
  CO2             775.84

  FUEL ECONOMY  (MILES/GAL)

  EPAMPG           11.17
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                        ****** CVS 977 ******

                        *** IDENTIFICATION ***

TEST DATE: 7-9-76                 ROAD TEST: NA
VEHICLE:   ETV 24                 DRIVER: MIKE K
MATERIAL: GEM 68-0B/0F            TEST MILES: 2075

COMMENTS:        VAC. RETARD IS WORKING ON A TIMMER
                 4012 CC = 10.47 MPG.

                          *** TEST DATA ***

TEMP: 65   F (WET)                PRES: 748.435  MM HG (BARO)
      76   F (DRY)                      22.922  MM HG (VAPOR)
      90   F (MIX)                      22.925  IN. H20 (INLET)
RH:  55  %                              18.4625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2966
BLOWER RPM (ACT): 929.034         BLOWER RPM (CAL): 928.825

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          505.1            868.7            505.7
BLOWER REVS          7820             13452            7830
CO  (PPM)         3.70  373.00    8.00   52.20    1.70  139.00
HC  (PPM C)       5.32  170.68    6.84   26.12    5.24   37.40
NOX (PPM)         0.44   23.20    0.62    8.21    0.31    6.05
CO2 (%)           0.04    3.26    0.07    1.77    0.05    2.67

                     *** CALCULATED RESULTS ***

                 BAG 1            BAG 2             BAG 3

VMIX (CF)        2067.07          3555.79           2069.71
DF               4.04667          7.53842           4.98757

CORRECTED CONCENTRATIONS

NOX (PPM)         22.87             7.67              7.80
HC  (PPM C)      166.67            20.19             33.21
CO  (PPM)        340.23            42.68            128.05
CO2 (%)            3.23             1.71              2.63

MASS EMISSIONS  (GRAMS/BAG)

NOX                2.55             1.47              0.87
HC                 5.63             1.17              1.12
CO                23.19             5.00              8.74
CO2             3481.74          3169.60           2838.73

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.41
HC                0.56
CO                2.66
CO2             837.98

FUEL ECONOMY  (MILES/GAL)              2145

EPAMPG           10.29
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                         ****** CVS 978 ******

                        *** IDENTIFICATION ***

  TEST DATE: 7-12-76                  ROAD TEST: NA
  VEHICLE:   ETV 24                   DRIVER: MIKE K
  MATERIAL:  GEM 68-OB/OF             TEST MILES: 2086

  COMMENTS:         CAP WAS NOT PREP. FOR 2 DAYS
                    LOW BARO.     4065 CC = 10.33 MOG.

                          *** TEST DATA ***

  TEMP:  64   F (WET)                 PRES: 739.185  MM HG (BARO)
         73   F (DRY)                        20.815  MM HG (VAPOR)
         99   F (MIX)                        23.0125  IN. H20 (INLET)
  RH:   61  %                                18.55   IN. H20 (OUTLET)
  INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
  FUEL: HO III                        CF/REV: .2975
  BLOWER RPM (ACT): 929.004           BLOWER RPM (CAL): 928.807

                      BAG 1              BAG 2              BAG 3
                    AIR     EX         AIR     EX         AIR     EX

  TIME (SECS)         505.8              868.7              505.9
  BLOWER REVS         7831               13450              7834
  CO   (PPM)       3.50  247.00       4.80    38.80      2.40    64.60
  HC   (PPM C)     4.64   95.92       5.00    25.08      4.88    44.96
  NOX  (PPM)       0.23   21.60       0.32     8.04      0.28     6.48
  CO2  (%)         0.04    3.23       0.06     1.76      0.04     2.66

                     *** CALCULATED RESULTS ***

                   BAG 1              BAG 2              BAG 3

  VMIX (CF)        2015.9             3462.38            2016.67
  DF               4.10757            7.587              5.01779

  CORRECTED CONCENTRATIONS

  NOX (PPM)          21.43               7.76               6.26
  HC  (PPM C)        92.41              20.74              41.05
  CO  (PPM)         224.18              32.64              58.14
  CO2 (%)             3.20               1.71               2.63

  MASS EMISSIONS   (GRAMS/BAG)

  NOX                 2.35               1.46               0.69
  HC                  3.04               1.17               1.35
  CO                 14.90               3.73               3.27
  CO2              3363.86            3083.85            2763.82

  WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

  NOX                 0.38
  HC                  0.43
  CO                  1.64
  CO2               814.09

  FUEL ECONOMY  (MILES/GAL)

  EPAMPG             10.63
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                    ****** CVS 979 ******

                   *** IDENTIFICATION ***

TEST DATE: 7-13-76                ROAD TEST: NA
VEHICLE:  ETV 24                  DRIVER: MUIKE K
MATERIAL: GEM 68-OB/OF            TEST MILES: 2097

COMMENTS:         ONLY CHANGES TO ENGINE WAS MOVING XCELL PUMP ROD
                  TO FRONT HOLE      4024 CC = 10.44 MPG.

                     *** TEST DATA ***

TEMP: 64  F (WET)                 PRES: 741.385  MM HG (BARO)
      77  F (DRY)                        23.756  MM HG (VAPOR)
      99  F (MIX)                        23.1875  IN. H2O (INLET)
RH:  48  %                               18.8125  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2979
BLOWER RPM (ACT): 928.807         BLOWER RPM (CAL): 928.763

                     BAG 1           BAG 2            BAG 3
                  AIR     EX      AIR     EX       AIR     EX

TIME (SECS)         504.9           869.4            506.5
BLOWER REVS         7315            13459            7841
CO  (PPM)         2.20  260.00    5.20   33.00     2.80   64.40
HC  (PPM C)       0.16  116.88    5.12   29.20     4.44   39.24
NOX (PPM)         0.39   27.45    0.50    7.20     0.18    6.26
CO2 (%)           0.04    3.16    0.06    1.77     0.04    2.68

                  *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2020.07          3478.97          2026.79
DF               4.19313          7.54481          4.98154

CORRECTED CONCENTRATIONS

NOX (PPM)          27.15             6.77             6.12
HC  (PPM C)       116.76            24.76            35.69
CO  (PPM)         238.50            26.92            57.88
CO2 (%)             3.13             1.72             2.65

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.38             1.23             0.65
HC                  3.35             1.41             1.18
CO                 15.38             3.09             3.87
CO2              3296.37          3116.85          2798.39

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.38
HC                  0.50
CO                  1.62
CO2               817.32

FUEL ECONOMY  (MILES/GAL)

EPAMPG             10.63
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                    ****** CVS 980 ******

                   *** IDENTIFICATION ***

TEST DATE: 7-14-76              ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: MIKE K
MATERIAL: GEM 68-OB/OF          TEST MILES: 2112

COMMENTS:       CHOKE SET LEANER & COLD IDLE SPEED SET LOWER- ONE RETUR
SPRING
                REMOVED - CARB. IS NOT RIGHT! 4068 CC = 10.33 M.P.G.

                     *** TEST DATA ***

TEMP: 65   F (WET)              PRES: 742.285  MM HG (BARO)
      77   F (DRY)                    23.756  MM HG (VAPOR)
      102  F (MIX)                    23.1  IN. H20 (INLET)
RH:  52  %                            18.55  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2974
BLOWER RPM (ACT): 928.906       BLOWER RPM (CAL): 928.798

                    BAG 1            BAG 2           BAG 3
                  AIR    EX        AIR    EX       AIR    EX

TIME (SECS)          505.8            869            505.8
BLOWER REVS          7830            13453           7832
CO  (PPM)         7.90  342.00     7.80   60.00    7.00  180.00
HC  (PPM C)       5.84  186.80     6.00   27.60    6.52   40.80
NOX (PPM)         0.36   19.40     0.41    6.91    0.31    6.40
CO2 (%)           0.04    3.26     0.05    1.76    0.06    2.67

                  *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)       2012.58        3457.89        2013.1
DF              4.04814        7.57723        4.97983

CORRECTED CONCENTRATIONS

NOX (PPM)         19.13          6.55           6.15
HC  (PPM C)      182.40         22.39          35.59
CO  (PPM)        308.94         50.30         162.22
CO2 (%)            3.23          1.72           2.62

MASS EMISSIONS  (GRAMS/BAG)

NOX                2.07          1.22           0.67
HC                 5.99          1.26           1.17
CO                20.50          5.73          10.77
CO2             3389.96       3095.52        2752.71

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.33
HC                 0.60
CO                 2.76
CO2              816.30

FUEL ECONOMY  (MILES/GAL)

EPAMPG            10.56
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                    ****** CVS 981 ******

                   *** IDENTIFICATION ***

TEST DATE:  7-15-76              ROAD TEST: NA
VEHICLE:   ETV 24                DRIVER: MIKE K
MATERIAL:  GEM 680E/OF           TEST MILES: 2130

COMMENTS:        ENGINE SET LEANER WITH SMALLER RODS - ROOM VERY HOT
                 CARBURETOR LOOKS BETTER - 4004 CC = 10.49 MPG

                     *** TEST DATA ***

TEMP: 75   F (WET)               PRES: 742.185  MM HG (BARO)
      82   F (DRY)                     28.021  MM HG (VAPOR)
      107  F (MIX)                     23.1  IN. H20 (INLET)
RH:  73  %                             18.375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .2972
BLOWER RPM (ACT): 928.477        BLOWER RPM (CAL): 928.816

                     BAG 1           BAG 2           BAG 3
                   AIR    EX       AIR    EX       AIR    EX

TIME (SECS)          505.6           867.7           506.1
BLOWER REVS          7823            13423           7837
CO  (PPM)          1.20  257.00    2.10   50.00    1.00  132.00
HC  (PPM C)        5.36  105.60    5.64   26.80    5.32   47.16
NOX (PPM)          0.41   15.10    0.35    8.10    0.32    8.35
CO2 (%)            0.05    3.10    0.07    1.84    0.06    2.76

                  *** CALCULATED RESULTS ***

                   BAG 1           BAG 2           BAG 3

VMIX (CF)          1991.29         3416.73         1994.85
DF                 4.27552         7.2535          4.82552

CORRECTED CONCENTRATIONS

NOX (PPM)            14.79            7.80            8.10
HC  (PPM C)         101.49           21.94           42.94
CO  (PPM)           234.71           45.28          121.10
CO2 (%)               3.06            1.78            2.71

MASS EMISSIONS  (GRAMS/BAG)

NOX                   2.06            1.87            1.13
HC                    3.30            1.22            1.40
CO                   15.41            5.10            7.96
CO2                3179.44         3171.03         2821.79

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.45
HC                    0.46
CO                    2.17
CO2                 819.55

FUEL ECONOMY  (MILES/GAL)

EPAMPG               10.66
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                         ****** CVS 982 ******

                        *** IDENTIFICATION ***

TEST DATE: 7-16-76                 ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: MIKE K
MATERIAL: GEM 68-0B/0F             TEST MILES: 2141

COMMENTS:         BAD START 3RD BAG
                  3992 CC = 10.52 MPG.

                           *** TEST DATA ***

TEMP: 71   F (WET)                 PRES: 740.285  MM HG (BARO)
      79   F (DRY)                        25.509  MM HG (VAPOR)
      105  F (MIX)                        22.925  IN. H20 (INLET)
RH:  68  %                                18.375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2971
BLOWER RPM (ACT): 928.996          BLOWER RPM (CAL): 928.834

                       BAG 1           BAG 2           BAG 3
                    AIR     EX      AIR     EX      AIR     EX

TIME (SECS)            506.3           867.9           505.7
BLOWER REV.S           7839            13438           7830
CO   (PPM)          2.80  311.00    4.80   41.40    1.70  112.00
HC   (PPM C)        5.12  144.36    6.40   29.16    5.52   65.64
NOX (PPM)           0.40   15.40    0.48    8.59    0.40    8.74
CO2 (%)             0.04    2.99    0.06    1.76    0.06    2.66

                      *** CALCULATED RESULTS ***

                    BAG 1           BAG 2           BAG 3

VMIX (CF)           1997.19         3423.69         1994.9
DF                  4.41798         7.58423         5.00571

CORRECTED CONCENTRATIONS

NOX (PPM)             15.09            8.17            8.42
HC   (PPM C)         140.40           23.60           61.22
CO   (PPM)           284.15           35.01          102.47
CO2 (%)                2.96            1.71            2.61

MASS EMISSIONS  (GRAMS/BAG)

NOX                    1.89            1.76            1.06
HC                     4.58            1.32            1.99
CO                    18.71            3.95            6.74
CO2                 3081.96         3049.39         2717.35

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                    0.42
HC                     0.59
CO                     2.11
CO2                  789.80

FULL ECONOMY  (MILES/GAL)

EPAMPG                11.04
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                    ****** CVS 983 ******

                    *** IDENTIFICATION ***

TEST DATE: 7-19-76                  ROAD TEST: NA
VEHICLE:  ETV 24                    DRIVER: MIKE K
MATERIAL: GEM 68-0B/0F              TEST MILES: 2152

COMMENTS:        NOT RE   PREP. FOR 2 DAYS
                 377 2 CC = 11.13 MPG.

                      *** TEST DATA ***

TEMP: 66   F (WET)                  PRES: 750.985  MM HG (BARO)
      81   F (DRY)                         27.055  MM HG (VAPOR)
      102   F (MIX)                        23.45  IN. H20 (INLET)
RH:  40  %                                 18.55  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .2972
BLOWER RPM (ACT): 928.425           BLOWER RPM (CAL): 928.763

                    BAG 1          BAG 2           BAG 3
                  AIR    EX      AIR    EX       AIR    EX

TIME (SECS)         506.1          866.8           505.7
BLOWER REVS         7834           13418           7817
CO  (PPM)         2.20  200.00   3.10   21.90    2.80   10.40
HC  (PPM C)       4.96  107.60   5.60   32.84    5.12   48.32
NOX (PPM)         0.36   35.64   0.62    8.64    0.36   15.10
CO2 (%)           0.04    2.86   0.06    1.70    0.06    2.46

                  *** CALCULATED RESULTS ***

                 BAG 1           BAG 2            BAG 3

VMIX (CF)        2035.69         3486.71          2031.27
DF               4.63764         7.85751          5.43432

CORRECTED CONCENTRATIONS

NOX (PPM)         35.36            8.10            14.81
HC  (PPM C)      103.71           27.95            44.14
CO  (PPM)        184.70           18.23             7.52
CO2 (%)            2.83            1.65             2.41

MASS EMISSIONS  (GRAMS/BAG)

NOX                 3.70           1.45             1.55
HC                  3.45          1.59             1.46
CO                 12.40          2.10             0.50
CO2              3002.90       2995.92          2554.03

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.52
HC                  0.52
CO                  1.03
CO2               765.73

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.46
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                    ****** CVS 984 ******

                    *** IDENTIFICATION ***

TEST DATE: 7-20-76              ROAD TEST: NA
VEHICLE:  ETV 24                DRIVER: MIKE K
MATERIAL: GEM 68-OB/OF          TEST MILES: 2163

COMMENTS:       NO CHANGES FROM PREVIOUS TEST
                3776 CC = 11.12 MPG.

                      *** TEST DATA ***

TEMP: 68  F (WET)               PRES: 747.935  MM HG (BARO)
      82  F (DRY)                     28.021  MM HG (VAPOR)
      101  F (MIX)                    23.3625  IN. H20 (INLET)
RH:  48  %                            18.6375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2975
BLOWER RPM (ACT): 928.461       BLOWER RPM (CAL): 928.763

                    BAG 1            BAG 2            BAG 3
                  AIR    EX        AIR    EX        AIR    EX

TIME (SECS)         506.7            868.8            506
BLOWER REVS         7832             13450            7833
CO  (PPM)       10.50  262.00     9.70    25.30   10.20   30.40
HC  (PPM C)      6.20  141.52     7.00    33.64    6.68   55.72
NOX (PPM)        0.34   36.16     0.61     7.30    0.37   14.60
CO2 (%)          0.05    2.95     0.07     1.72    0.07    2.46

                   *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2031.97          3489.53          2032.23
DF               4.48392          7.76465          5.42857

CORRECTED CONCENTRATIONS

NOX (PPM)         35.90             6.77            14.30
HC  (PPM C)      136.70            27.54            50.27
CO  (PPM)        235.03            15.75            20.30
CO2 (%)            2.91             1.66             2.40

MASS EMISSIONS  (GRAMS/BAG)

NOX                4.04             1.31             1.61
HC                 4.54             1.57             1.67
CO                15.75             1.81             1.36
CO2             3084.87          3019.06          2545.61

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.53
HC                 0.60
CO                 1.25
CO2              772.95

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.32
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                     ****** CVS 985 ******

                    *** IDENTIFICATION ***

TEST DATE:  7 -21-76               ROAD TEST: NA
VEHICLE:   ETV 24                 DRIVER: MIKE K
MATERIAL:  GEM NONE               TEST MILES: 2174

COMMENTS:        BASELINE TEST  NO CHANGES MADE FROM LAST CATALYST TEST
                 37 61 CC = 11.17 MPG.

                      *** TEST DATA ***

TEMP:  72   F (WET)               PRES: 744.785  MM HG (BARO)
       77   F (DRY)                     23.756  MM HG (VAPOR)
      100   F (MIX)                     23.3625  IN. H20 (INLET)
RH:   79  %                             18.55  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2976
BLOWER RPM (ACT): 928.938         BLOWER RPM (CAL): 928.772

                      BAG 1           BAG 2           BAG 3
                    AIR    EX      AIR    EX       AIR    EX

TIME (SECS)           506.2           868.1           506.3
BLOWER REVS           7837            13440           7839
CO  (PPM)          2.50 1582.00  17.40 1576.00  34.40 1500.00
HC  (PPM C)        5.36  394.12   8.48  270.64  12.88  339.84
NOX (PPM)          0.41   38.46   0.52   12.30   0.54   31.53
CO2 (%)            0.04    2.70   0.06    1.52   0.06    2.31

                  *** CALCULATED RESULTS ***

                  BAG 1          BAG 2          BAG 3

VMIX (CF)        2028.66        3479.03        2029.18
DF               4.64415        7.9008         5.39564

CORRECTED CONCENTRATIONS

NOX (PPM)          38.14          11.85          31.09
HC  (PPM C)       389.91         263.23         329.35
CO  (PPM)        1457.50        1474.86        1367.71
CO2 (%)            2.67           1.47           2.26

MASS EMISSIONS  (GRAMS/BAG)

NOX                5.08           2.71           4.15
HC                12.92          14.95          10.91
CO                97.48         169.17          91.50
CO2             2823.25        2662.63        2392.75

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.97
HC                 3.56
CO                35.10
CO2              698.74

FUEL ECONOMY  (MILES/GAL)                   252<

EPAMPG            11.50
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                     ****** CVS 986 ******

                    *** IDENTIFICATION ***

TEST DATE:  7-22-76                ROAD TEST: NA
VEHICLE:   ETV 24                  DRIVER: MIKE K
MATERIAL: GEM NAONE                TEST MILES: 2185

COMMENTS:         BASELINE TEST    NO CHANGES MADE
                  3742 CC = 11.22 MPG.

                       *** TEST DATA ***

TEMP: 67  F (WET)                  PRES: 748.335  MM HG (BARO)
      77  F (DRY)                          23.756  MM HG (VAPOR)
     100  F (MIX)                          23.3625  IN. H20 (INLET)
RH:  59  %                                 18.8125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2976
BLOWER RPM (ACT): 928.878          BLOWER RPM (CAL): 928.746

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          505.1            868.9            505.3
BLOWER REVS          7820             13452            7822
CO  (PPM)        2.00 1612.00   19.60 1495.00   21.80 1513.00
HC  (PPM C)      5.32  344.00    7.96  252.40    9.96  328.28
NOX (PPM)        0.26   50.10    0.38   13.90    0.43   35.35
CO2 (%)          0.04    2.78    0.05    1.50    0.04    2.16

                   *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

VMIX (CF)        2034.97          3500.56          2035.49
DF               4.52107          8.03562          5.73887

CORRECTED CONCENTRATIONS

NOX (PPM)          49.90            13.57            34.99
HC  (PPM C)       339.86           245.43           320.06
CO  (PPM)        1493.49          1406.51          1403.60
CO2 (%)             2.75             1.46             2.13

MASS EMISSIONS  (GRAMS/BAG)

NOX                 5.71             2.67             4.01
HC                 11.29            14.03            10.64
CO                100.20           162.33            94.20
CO2              2917.18          2658.40          2257.80

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.99
HC                  3.33
CO                 34.55
CO2               693.30

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.58
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                    *** TOTAL BAG A ***

                  *** IDENTIFICATION ***

TEST DATE: 9-3-75
VEHICLE:  EIV 24                  DRIVER: LARRY
MATERIAL: GEM 68 00/0F            TEST MILES: 500

COMMENTS:        MANIFOLD VACUUM ADVANCE    30 SEC. FULL AIR
                 2.5 MIN. NO VACUUM ADVANCE  FUEL 20 DEGREE C

                     *** TEST DATA ***

TEMP: 63  F (WET)                 PRES: 748.735  MM HG (BARO)
      78  F (DRY)                         24.617  MM HG (VAPOR)
      100  F (MIX)                        25.375  IN. H2O (INLET)
RH:  43  %                                19.425  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3012
CC FUEL: 1047.                    BLOWER RPM (CAL): 928.481
                                  BLOWER RPM (ACT): 928.653

                   BAG
               AIR     EX

TIME (SEC)          505.7
BLOWER REVS         7827
CO (PPM)          10.00    20.00
HC (PPM C)         4.84    27.72
NOX (PPM)          0.40    33.70
CO2 (5)            0.04     2.29

                *** CALCULATED RESULTS ***

                 BAG

VMIX (CF)         2051.45
DF                5.83966

CORRECTED CONCENTRATIONS

NOX (PPM)           33.37
HC (PPM C)          23.71
CO  (PPM)           10.67
CO2 (%)              2.26

MASS EMISSIONS  (GRAMS/MILE)

NOX                  0.97
HC                   0.22
CO                   0.20
CO2                672.55

FUEL ECONOMY  (MILES/GAL)

CARBON              13.17
WEIGHT              12.98
% DIFFERENCE     -1.5
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                     [illegible] B

                 *** IDENTIFICATION ***

TEST DATE: 9-?-75
VEHICLE: [illegible]                    DRIVER: LARRY
MATERIAL: [illegible]                   TEST MILES: 400

COMMENTS:         1089 CC      505.2 SEC.    26 DEG. [illegible] C
                  PURGED VACUUM             30 SEC PURGE AIR

                     *** TEST DATA ***

TEMP: 63   F (WET)                 PRESS: 743.735  MM HG (BARO)
      72   F (DRY)                         24.617  MM HG (VAPOR)
      100  F (MIX)                         25.375  IN. H2O (INLET)
RH:  43  %                                 19.425  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3012
CC FUEL: 1089                      BLOWER RPM (CAL): 928.421
                                   BLOWER RPM (ACT): 928.741

                  BAG
               AIR      EX

TIME (SEC)           505.2
BLOWER REVS          7820
CO (PPM)          10.00     24.00
HC (PPM C)         4.96     26.32
NOX (PPM)          0.56     26.20
CO2 (%)            0.04      2.38

               *** CALCULATED RESULTS ***

              BAG

VMIX (CF)         2049.62
DF                5.61871

CORRECTED CONCENTRATIONS

NOX (PPM)          25.74
HC (PPM C)         22.24
CO  (PPM)          14.46
CO2 (%)             2.35

MASS EMISSIONS  (GRAMS/MILE)

NOX                0.75
HC                 0.21
CO                 0.27
CO2              698.82

FUEL ECONOMY  (MILES/GAL)

WEIGHT            12.48
CARBON            12.68
% DIFFERENCE    -1.6
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                    *** TIMED BAG C ***

                  *** IDENTIFICATION ***

TEST DATE: [illegible]-75
VEHICLE:  ETV 20                    DRIVER: LARRY
MATERIAL: GEM 63 00/[illegible]     TEST MILES: 500

COMMENTS:       PORTED VACUUM ADVANCE   30 SEC PORT AIR
                1.5 MIN. NO VACUUM ADVANCE  FUEL 20 DEGREE C

                    *** TEST DATA ***

TEMP: 63  F (WET)                   PRES: 748.735  MM HG (BARO)
      78  F (DRY)                         24.617  MM HG (VAPOR)
      100  F (MIX)                        25.375  IN. H2O (INLET)
RH:  43  %                                19.425  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3012
CC FUEL: 1064                       BLOWER RPM (CAL): 928.881
                                    BLOWER RPM (ACT): 928.692

                  BAG
              AIR      EX

TIME (SEC)        505.55
BLOWER REVS       7825
CO (PPM)        7.00    23.00
HC (PPM C)      4.96    28.84
NOX (PPM)       0.39    24.00
CO2 (%)         0.04     2.33

               *** CALCULATED RESULTS ***

                BAG

VMIX (CF)       2050.93
DF              5.73864

CORRECTED CONCENTRATIONS

NOX (PPM)         23.68
HC (PPM C)        24.74
CO  (PPM)         15.75
CO2 (%)            2.30

MASS EMISSIONS  (GRAMS/MILE)

NOX                0.69
HC                 0.23
CO                 0.50
CO2              684.33

FUEL ECONOMY  (MILES/GAL)

CARBON            12.94
WEIGHT            12.77
% DIFFERENCE   -1.3
```

```
                    *** THIRD BAG 582 ***

                  *** IDENTIFICATION ***

TEST DATE: 9/15/75
VEHICLE:  ETV 24               DRIVER: LARRY
MATERIAL: GEM BASELINE         TEST MILES: 2790

COMMENTS:      THIRD BAG COMPUTATION OF BASELINE
               N/A

                     *** TEST DATA ***

TEMP: 72  F (WET)              PRES: 751.135  MM HG (BARO)
      80  F (DRY)                     26.271  MM HG (VAPOR)
     100  F (MIX)                     26.075  IN. H20 (INLET)
RH:  68  %                            19.95  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3026
CC FUEL:NONE                   BLOWER RPM (CAL): 928.358
                               BLOWER RPM (ACT): 928.25

                    BAG
                 AIR    EX

TIME (SEC)           499.65
BLOWER REVS          7730
CO (PPM)         1.00     2.00
HC (PPM C)      14.60    36.52
NOX (PPM)        1.07    77.42
CO2 (5)          0.04     2.23

                 *** CALCULATED RESULTS * *

               BAG

VMIX (CF)       2038.76
DF              5.99864

CORRECTED CONCENTRATIONS

NOX (PPM)         76.53
HC (PPM C)        24.35
CO  (PPM)          1.06
CO2 (%)            2.20

MASS EMISSIONS  (GRAMS/MILE)

NOX                2.75
HC                 0.23
CO                 0.02
CO2              650.56

FUEL ECONOMY  (MILES/GAL)

CARBON            13.62
```

```
                        *** THIRD BAG 584 ***

                       *** IDENTIFICATION ***

    TEST DATE: 9/15/75
    VEHICLE:  ETV 24                   DRIVER: LARRY
    MATERIAL: GEM BASELINE             TEST MILES: 2813

    COMMENTS:          THIRD BAG COMPUTATION OF BASELINE
                       N/A

                            **  TEST DATA **

    TEMP: 73  F (WET)                  PRES: 749.135  MM HG (BARO)
          80  F (DRY)                        26.271  MM HG (VAPOR
          100  F (MIX)                       26.075  IN. H2O (INLET)
    RH:  72  %                               19.95  IN. H2O (OUTLET)
    INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
    FUEL: HO III                       CF/REV: .3028
    CC FUEL:NONE                       BLOWER RPM (CAL): 928.358
                                       BLOWER RPM (ACT): 929.228

                            BAG
                        AIR     EX

    TIME (SEC)              505
    BLOWER REVS             7821
    CO (PPM)           1.00     2.00
    HC (PPM C)        17.60    38.36
    NOX (PPM)          1.17    82.58
    CO2 (5)            0.03     2.23

                       *** CALCULATED RESULTS ***

                      BAG

    VMIX (CF)          2057.96
    DF                 5.99815

    CORRECTED CONCENTRATIONS

    NOX (PPM)            81.61
    HC (PPM C)           23.69
    CO  (PPM)             1.05
    CO2 (%)               2.21

    MASS EMISSIONS  (GRAMS/MILE)

    NOX                   3.08
    HC                    0.22
    CO                    0.02
    CO2                 659.18

    FUEL ECONOMY  (MILES/GAL)

    CARBON               13.45
```

```
                        *** THIRD BAG 587 ***

                      *** IDENTIFICATION  **

TEST DATE: 9/15/75
VEHICLE:  ETV 24                    DRIVER: MIKE K
MATERIAL: GEM BASELINE              TEST MILES: 2858

COMMENTS:        THIRD BAG COMPUTATION OF TBASELINE
                 N/A

                         * * TEST DATA * *

TEMP: 74  F (WET                    PRES: 751.995  MM HG  BARO)
      82  F (DRY)                         28.021  MM HG (VAPOR)
      100  F (MIX                         25.9  IN. H20 (INLET)
RH:  69  %                                19.8625  IN. H20 (OUTLET)
INERTIA WT.: 400 LBS                BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3022
CC FUEL:NONE                        BLOWER RPM (CAL): 928.384
                                    BLOWER RPM (ACT): 928.414

                   BAG
                 AIR    EX

TIME (SEC)          506.8
BLOWER REVS         7842
CO (PPM)        13.00   20.00
HC (PPM C)      14.24   35.12
NOX (PPM)        1.48   80.00
CO2 (5)          0.07    2.32

                  *** CALCULATED RESULTS ***

                BAG

VMIX (CF)        2068.96
DF               5.7625

CORRECTED CONCENTRATIONS

NOX (PPM)          78.78
HC (PPM C)         23.35
CO  (PPM)           8.16
CO2 (%)             2.26

MASS EMISSIONS  (GRAMS/MILE)

NOX                 3.02
HC                  0.22
CO                  0.15
CO2              679.38

FUEL ECONOMY  (MILES/GAL)

CARBON             13.03
```

```
                          *** THIRD BAG 2 ***

                        *** IDENTIFICATION ***

TEST DATE: 9-15-75
VEHICLE:   ETV 24                      DRIVER: MIKE E
MATERIAL:  GEM NONE                    TEST MILES: 3000

COMMENTS:        EGR (A)  .071 JETS - .042 RODS PORTED VACUUM
                 DUMMY SYSTEM  FUEL 23 DEGREE C

                          *** TEST DATA ***

TEMP: 58  F (WET)                      PRES: 753.985  MM HG (BARO)
      75  F (DRY)                            22.243  MM HG (VAPOR)
      90  F (MIX)                            26.075  IN. H2O (INLET)
RH:  34  %                                   19.95  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS                  BLOWER SPEED:  3
FUEL: HO III                           CF/REV: .3024
CC FUEL: 1068                          BLOWER RPM (CAL): 928.358
                                       BLOWER RPM (ACT): 928.419

                       BAG
                    AIR     EX

TIME (SEC)            504.6
BLOWER REVS           7808
CO (PPM)          58.00  2084.00
HC (PPM C)         7.76   248.80
NOX (PPM)          1.03    87.50
CO2 (5)            0.04     2.00

                     *** CALCULATED RESULTS ***

                  BAG

VMIX (CF)          2103.72
DF                 6.02798

CORRECTED CONCENTRATIONS

NOX (PPM)            86.64
HC (PPM C)          242.33
CO  (PPM)          1933.03
CO2 (%)               1.97

MASS EMISSIONS  (GRAMS/MILE)

NOX                   2.40
HC                    2.32
CO                   37.35
CO2                 601.00

FUEL ECONOMY  (MILES/GAL)

CARBON               13.30
WEIGHT               12.73
% DIFFERENCE   -4.5
```

```
                    *** THIRD BAG 3 ***

                  *** IDENTIFICATION ***

TEST DATE: 9-15-75
VEHICLE:  EIV 24                  DRIVER: MIKE E.
MATERIAL: GEM NONE                TEST MILES: 3000

COMMENTS:           EGR (?) ANEROID ADJUSTED OUT 1/4 TURN FROM (?) GAL.
                    FUEL 25 DEGREE C  .071/.042  P.V.C.

                     *** TEST DATA ***

TEMP: 57  F (WET)                 PRES: 753.085  MM HG (BARO)
      73  F (DRY)                        22.243  MM HG (VAPOR)
      90  F (MIX)                        26.075  IN. H2O (INLET)
RH:  35  %                               19.775  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3042
CC FUEL: 1044                     BLOWER RPM (CAL): 898.375
                                  BLOWER RPM (ACT): 898.52

                   BAG
               AIR      EX

TIME (SEC)          507.9
BLOWER REVS          7600
CO (PPM)        24.00   2457.00
HC (PPM C)       6.00    264.00
NOX (PPM)        0.62     79.30
CO2 (%)          0.04      1.89

                 *** CALCULATED RESULTS ***

               BAG

VMIX (CF)        2116.23
DF               6.23145

CORRECTED CONCENTRATIONS

NOX (PPM)          78.78
HC (PPM C)        258.93
CO  (PPM)        2323.23
CO2 (%)             1.86

MASS EMISSIONS  (GRAMS/MILE)

NOX                2.21
HC                 2.99
CO                45.15
CO2              570.69

FUEL ECONOMY  (MILES/GAL)

CARBON            13.66
WEIGHT            13.02
% DIFFERENCE    -4.9
```

```
                    *** HIGHWAY NO. 4 ***

                  *** IDENTIFICATION ***

TEST DATE: 9-15-75
VEHICLE:  EIV 24                      DRIVER: MIKE S
MATERIAL: GEM NONE                    TEST MILES: 3000

COMMENTS:        EGR (C) NO CARBURETOR CHANGES NEEDED TO RUN THIS
                 FUEL 87 DEGREE C  .071/.032 P.V.A.

                    *** TEST DATA ***

TEMP: 60  F (WET)                     PRES: 753.985  MM HG (BARO)
      77  F (DRY)                            23.756  MM HG (VAPOR)
      92  F (MIX)                            26.075  IN. H20 (INLET)
RH:  34  %                                   20.125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                 BLOWER SPEED:  3
FUEL: NO III                          CF/REV: .3026
CC FUEL: 1028                         BLOWER RPM (CAL): 928.34
                                      BLOWER RPM (ACT): 928.521

                     BAG
                 AIR      EX

TIME (SEC)           507
BLOWER REVS          7846
CO (PPM)         44.00   2347.00
HC (PPM C)       10.32    264.40
NOX (PPM)         6.77     80.70
CO2 (%)           0.04      1.91

               *** CALCULATED RESULTS ***

                 BAG

VMIX (CF)         2107.78
DF                6.2034

CORRECTED CONCENTRATIONS

NOX (PPM)           80.05
HC (PPM C)         255.74
CO  (PPM)         2198.43
CO2 (%)              1.88

MASS EMISSIONS  (GRAMS/MILE)

NOX                 2.25
HC                  2.45
CO                 42.56
CO2               574.54

FUEL ECONOMY  (MILES/GAL)

CARBON             13.67
WEIGHT             13.26
% DIFFERENCE    -3.1
```

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                    *** [illegible] ***

                  *** IDENTIFICATION ***

TEST DATE: [illegible]-15-75
VEHICLE: [illegible]                DRIVER: [illegible]
MATERIAL: [illegible]               TEST MILES: 3000

COMMENTS:       EGR (0)  [illegible] CARBURETOR CHANGES .071/.042 [illegible]
                FUEL 37 [illegible] C

                    *** TEST DATA ***

TEMP: 60  F (WET)                  PRES: 753.[illegible]  MM HG (BARO)
      77  F (DRY)                        23.758  MM HG (VAPOR)
      92  F (MIX)                        26.075  IN. H2O (INLET)
RH:  32  %                               19.95  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3024
CC FUEL: 1030                      BLOWER RPM (CAL): 928.35[illegible]
                                   BLOWER RPM (ACT): 928.[illegible]

                  BAG
               AIR      EX

TIME (SEC)           505.7
BLOWER REVS          7827
CO (PPM)          41.00  2497.00
HC (PPM C)        10.00   250.40
NOX (PPM)          0.30    79.20
CO2 (%)            0.04     1.94

              *** CALCULATED RESULTS ***

               BAG

VMIX (CF)          2101.19
DF                 6.08307

CORRECTED CONCENTRATIONS

NOX (PPM)            78.95
HC (PPM C)          242.04
CO  (PPM)          2344.03
CO2 (%)               1.91

MASS EMISSIONS  (GRAMS/MILE)

NOX                   2.17
HC                    2.31
CO                   45.23
CO2                 581.94

FUEL ECONOMY  (MILES/GAL)

CARBON               13.44
WEIGHT               13.20
% DIFFERENCE       -1.8
```

```
                    *** [illegible] ***

                  *** IDENTIFICATION ***

TEST DATE: [illegible]-17-75
VEHICLE: [illegible]                      DRIVER: [illegible]
MATERIAL: [illegible]                     TEST MILES: 3[illegible]

COMMENTS:         502.[illegible] 25 DEGREE C 5 INCH SYSTEM [illegible] [illegible] VAG.
                  STANDARD IGNITION DIST. PLUGS POINTS COND. COIL

                    *** TEST DATA ***

TEMP: 65  F ([illegible])               [illegible]: 749.035  MM HG ([illegible])
      7[illegible]  F (DRY)                          25.50[illegible]  [illegible] HG ([illegible])
      [illegible]1  F (MIX)                          26.075  IN. H20 (INLET)
RH:  48  %                                 19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED: [illegible]3
FUEL: HO III                        CF/REV: .3022
CC FUEL: 996                        BLOWER RPM (CAL): 928.411
                                    BLOWER RPM (ACT): 92[illegible].75[illegible]

                   BAG
                AIR       [illegible]

TIME (SEC)          502.8
BLOWER REVS          7783
CO (PPM)          21.00  1868.00
HC (PPM C)         9.88   331.20
NOX (PPM)          0.74    75.50
CO2 (%)            0.04     1.88

                 *** CALCULATED RESULTS ***

                BAG

VMIX (CF)          2076.75
DF                 6.41067

CORRECTED CONCENTRATIONS

NOX (PPM)            74.88
HC (PPM C)          322.86
CO  (PPM)          1758.[illegible]
CO2 (%)               1.8[illegible]

MASS EMISSIONS  (GRAMS/MILE)

NOX                   2.32
HC                    3.05
CO                   33.45
CO2                 556.77

FUEL ECONOMY  (MILES/GAL)

CARBON               14.33
WEIGHT               13.65
% DIFFERENCE      -5.0
```

```
                    *** [illegible] ***

                   *** IDENTIFICATION ***

TEST DATE: 9-17-75
VEHICLE:  FIV 24                 DRIVER: [illegible]
MATERIAL: [illegible]            TEST MILES: 4000

COMMENTS:        FULL CENTRIFUGAL VACUUM ADVANCE
                 STANDARD IGNITION COMPONENTS 260[illegible] C 503.[illegible]

                    *** TEST DATA ***

TEMP: 65  F (DRY)               PRES: 740.035  MM HG (BARO)
      77  F (WET)                     23.756  MM HG (VAC[illegible])
      92  F (MIX)                     25.725  IN. H2O (INLET)
RH:  52  %                            19.6  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3019
CC FUEL: 1003                   BLOWER RPM (CAL): 928.423
                                BLOWER RPM (ACT): 928.460

                  BAG
              AIR     -4

TIME (SEC)            503.[illegible]
BLOWER REVS           7796
CO (PPM)          30.00  1753.00
HC (PPM C)        10.88   315.20
NOX (PPM)          1.08    69.30
CO2 (5)            0.04     1.97

               *** CALCULATED RESULTS ***

                 BAG

VMIX (CF)          2076.55
DF                  6.18324

CORRECTED CONCENTRATIONS

NOX (PPM)            68.39
HC (PPM C)          306.08
CO  (PPM)          1631.41
CO2 (%)               1.94

MASS EMISSIONS  (GRAMS/MILE)

NOX                   2.12
HC                    2.80
CO                   31.11
CO2                 584.14

FUEL ECONOMY  (MILES/GAL)

CARBON               13.82
WEIGHT               13.55
% DIFFERENCE     -2.0
```

```
                    *** [illegible] ***

                    *** [illegible] ***

TEST DATE: 9-17-75
VEHICLE:  RIV 24                        DRIVER: [illegible]
MATERIAL: GEN NINE                      TEST MILES: 3000

COMMENTS:          MAN. VAC. ADV.     CHECKING THERM [illegible]
                   505.5 SEC 20 DEGREE C

                    *** TEST DATA ***

TEMP: 65  F (WET)                       PRESS: 747.335  MM HG (BARO)
      77  F (DRY)                              23.756  MM HG (VACUUM)
      78  F (MIX)                              25.725  IN. H2O (INLET)
RH:  52  %                                     19.5125  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS                   BLOWER SPEED:  3
FUEL: 40 III                            CF/REV: .3019
CC FUEL: 941                            BLOWER RPM (CAL): 928.437
                                        BLOWER RPM (ACT): 9[illegible]

                    BAG
                 AIR    EXH

TIME (SEC)              505.6
BLOWER REVS             7822
CO (PPM)             36.00   1826.00
HC (PPM C)           12.60    447.60
NOX (PPM)             0.37     91.00
CO2 (%)               0.04      1.76

                 *** CALCULATED RESULTS ***

                 BAG

VMIX (CF)            2056.26
DF                   6.76766

CORRECTED CONCENTRATIONS

NOX (PPM)              90.17
HC (PPM C)            436.86
CO  (PPM)            1788.37
CO2 (%)                 1.73

MASS EMISSIONS  (GRAMS/MILE)

NOX                     2.77
HC                      4.03
CO                     32.52
CO2                   515.53

FUEL ECONOMY  (MILES/GAL)

CARBON                 15.31
WEIGHT                 14.44
% DIFFERENCE        -6.0
```

```
                    *** [illegible] BAG 3 ***

                  *** IDENTIFICATION ***

TEST DATE: 9-17-75
VEHICLE:   FIV 84                    DRIVER: [illegible]
MATERIAL:  [illegible]               TEST MILES: 3000

COMMENTS:       PURGED VAC. ADV. EGR 1220 .302 DEFIC
                507 SEC 32 DEGREES C

                    *** TEST DATA ***

TEMP: 65   F (WET)                   PRES: 747.835  MM HG (BARO)
      77   F (DRY)                          23.750  MM HG (VAPOR)
      98   F (CVS)                          25.725  IN. H20 (INLET)
RH:   52   %                                19.5125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                BLOWER SPEED:  3
FUEL: HO III                         CF/REV: .3019
CC FUEL: 993                         BLOWER RPM (CAL): 928.437
                                     BLOWER RPM (ACT): 928.546

                  BAG
              AIR      EX

TIME (SEC)          506.9
BLOWER REVS         7845
CO (PPM)          23.00   1950.00
HC (PPM C)        10.36    355.20
NOX (PPM)          0.74     57.10
CO2 (5)            0.04      1.24

              *** CALCULATED RESULTS ***

               BAG

VMIX (CF)          2062.3
DF                 6.5011

CORRECTED CONCENTRATIONS

NOX (PPM)            57.47
HC (PPM C)          346.93
CO  (PPM)          1837.57
CO2 (%)               1.21

MASS EMISSIONS  (GRAMS/MILE)

NOX                  1.77
HC                   3.25
CO                  34.80
CO2                541.09

FUEL ECONOMY  (MILES/GAL)

CARBON              14.64
WEIGHT              13.69
% DIFFERENCE    -7.0
```

```
                    *** [illegible] BAG 10 ***

                    *** IDENTIFICATION ***

TEST DATE: 9-18-75
VEHICLE:  ETV 24                   DRIVER: LARRY
MATERIAL: GEM [illegible]          TEST MILES: 4000

COMMENTS:        EGR 1220 (.302) ORIFICE  HEI SYSTEM
                 PORTED VACUUM ADVANCE  6 DEGREES BTDC  96 C

                      *** TEST DATA ***

TEMP: 66   F (WET)                 PRES: 744.785  MM HG (BARO)
      77   F (DRY)                        23.756  MM HG (VAPOR)
      97   F (MIX)                        25.375  IN. H2O (INLET)
RH:  58   %                               18.9  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3009
CC FUEL: 1042                      BLOWER RPM (CAL): [illegible]
                                   BLOWER RPM (ACT): [illegible]

                    BAG
 0             AIR     EX

TIME (SEC)          505
BLOWER REVS         7816
CO (PPM)       28.60   2008.00
HC (PPM C)      8.36    268.16
NOX (PPM)       0.71     65.54
CO2 (S)         0.04      2.10

               *** CALCULATED RESULTS ***

               BAG

VMIX (CF)        2045.66
DF               5.7865

CORRECTED CONCENTRATIONS-

                      NX (PPM:LR   64.95

HC (PPM C)        261.24
CO  (PPM)        1865.29
CO2 (%)             2.07

MASS EMISSIONS  (GRAMS/MILE)

NOX                 2.07
HC                  2.43
CO                 35.06
CO2               614.21

FUEL ECONOMY  (MILES/GAL)

CARBON             13.11
WEIGHT             13.05
% DIFFERENCE    -0.5
```

```
                    *** 1980 BAG 11 ***

                  *** IDENTIFICATION ***

TEST DATE: 9-18-75
VEHICLE:  FTV 24                DRIVER: LARRY
MATERIAL: GEM NONE              TEST MILES: 300

COMMENTS:       EGR 1220 (.302 ) ORFICE  HET SYSTEM
                MAN.VAC.ADV. W/SPARK DELAY 6 DEGREE BTDC

                    *** TEST DATA ***

TEMP: 66  F (WET)               PRES: 744.785  MM HG (BARO)
      77  F (DRY)                      23.756  MM HG (VAPOR)
      95  F (MIX)                      25.2  IN. H20 (INLET)
RH:  58  %                             19.075  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3009
CC FUEL: 1008                   BLOWER RPM (CAL): 928.834
                                BLOWER RPM (ACT): 928.358

                BAG
              AIR     EX

TIME (SEC)          506
BLOWER REVS         7830
CO (PPM)          22.30  2084.00
HC (PPM C)         9.20   297.36
NOX (PPM)          1.51    77.70
CO2 (%)            0.05     1.94

                 *** CALCULATED RESULTS ***

              BAG

VMIX (CF)          2057.5
DF                 6.18524

CORRECTED CONCENTRATIONS

NOX (PPM)           76.43
HC (PPM C)         289.65
CO  (PPM)         1948.79
CO2 (%)              1.90

MASS EMISSIONS  (GRAMS/MILE)

NOX                  2.45
HC                   2.71
CO                  36.82
CO2                567.30

FUEL ECONOMY  (MILES/GAL)

CARBON              14.00
WEIGHT              13.56
% DIFFERENCE     -3.2
```

```
                        *** [illegible] BAG 1 ***

                        *** IDENTIFICATION ***

TEST DATE: 9-18-75
VEHICLE: ELV 24                    DRIVER: LOWRY
MATERIAL: GF* NONE                 TEST MILES: 3000

COMMENTS:       12 DEGREES BTDC @ 1220 (.302) ORFICE API SYSTEM
                PORTED VAC.ADV.504.9 SEC.97 DEGREE C FUEL

                        *** TEST DATA ***

TEMP: 66  F (WET)                  PRES: 743.735  MM HG (BARO)
      74  F (EXT)                        21.453  MM HG (VAPOR)
      98  F (MIX)                        25.375  IN. H20 (INLET)
RH:  65  %                               19.075  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: NO III                       CF/REV: .3012
CC FUEL: 1020                      BLOWER RPM (CAL): 928.516
                                   BLOWER RPM (ACT): 928.71


                  BAG
               AIR     EX

TIME (SEC)             504.7
BLOWER REVS            7812
CO (PPM)          16.00  1995.00
HC (PPM C)         9.48   318.00
NOX (PPM)          0.63    74.70
CO2 (%)            0.04     1.96

                  *** CALCULATED RESULTS ***

                  BAG

VMIX (CF)         2040.04
DF                6.14796

CORRECTED CONCENTRATIONS

NOX (PPM)           74.17
HC (PPM C)         310.06
CO  (PPM)         1864.73
CO2 (%)              1.93

MASS EMISSIONS  (GRAMS/MILE)

NOX                  2.37
HC                   2.68
CO                  34.94
CO2                570.91

FUEL ECONOMY  (MILES/GAL)

CARBON              13.98
WEIGHT              13.32
% DIFFERENCE    -4.9
```

```
                    *** 1-BAG HOT 505 ***

                  *** IDENTIFICATION ***

TEST DATE: 9-18-75
VEHICLE: [illegible]                   DRIVER: [illegible]
MATERIAL: [illegible]                   TEST MILES: 4000

COMMENTS:        12 DEG. BTDC [illegible] 1220 .30? ORIFICE HOT START
                 MANIFOLD VACUUM ADV. 505.2 SEC 27 DEGREE C

                    *** TEST DATA ***

TEMP: 66  F (WET)                  PRES: 743.765  MM HG (BARO)
      74  F (DRY)                          21.453  MM HG (VAPOR)
      98  F (MIX)                          25.375  IN. H2O (INLET)
RH:  65  %                                 19.075  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3012
CC FUEL: 980                       BLOWER RPM (CAL): 928.516
                                   BLOWER RPM (ACT): 928.567

                BAG
             AIR     EX

TIME (SEC)          505.1
BLOWER REVS         7817
CO (PPM)          22.00  1836.00
HC (PPM C)        10.36   316.80
NOX (PPM)          0.86   100.00
CO2 (%)            0.04     1.88

            *** CALCULATED RESULTS ***

             BAG

VMIX (CF)         2041.45
DF                6.42753

CORRECTED CONCENTRATIONS

NOX (PPM)           99.27
HC (PPM C)         308.05
CO  (PPM)         1718.63
CO2 (%)              1.85

MASS EMISSIONS  (GRAMS/MILE)

NOX                 3.18
HC                  2.86
CO                 32.11
CO2               547.47

FUEL ECONOMY  (MILES/GAL)

CARBON             14.62
WEIGHT             13.87
% DIFFERENCE    -5.4
```

```
                    *** [illegible] BAG 1 ***

                  *** IDENTIFICATION ***

TEST DATE: 9-18-75
VEHICLE:  ETV 24                 DRIVER: LARRY
MATERIAL: [illegible]            TEST MILES: 3000

COMMENTS:        6 PSIG WITH SPARK DELAY VALVE   0.0. 302 ORIFICE
                 30 DEGREE C FUEL TEMP

                     *** TEST DATA ***

TEMP: 67  F (WET)                PRES: 741.385  MM HG (BARO)
      78  F (DRY)                       24.617  MM HG (VAPOR)
      98  F (MIX)                       25.375  IN. H2O (INLET)
RH:  56  %                              19.075  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3014
CC FUEL: 1079                    BLOWER RPM (CAL): 928.516
                                 BLOWER RPM (ACT): 928.34

                    BAG
                AIR     EXH

TIME (SEC)            507.1
BLOWER REVS           7846
CO (PPM)          26.00  2324.00
HC (PPM C)         8.40   279.48
NOX (PPM)          0.76    47.24
CO2 (%)            0.04     2.18

                  *** CALCULATED RESULTS ***

                  BAG

VMIX (CF)          2043.15
DF                 5.5226

CORRECTED CONCENTRATIONS

NOX (PPM)            46.62
HC (PPM C)          272.60
CO  (PPM)          2163.54
CO2 (%)               2.15

MASS EMISSIONS  (GRAMS/MILE)

NOX                   1.49
HC                    2.53
CO                   40.60
CO2                 636.08

FUEL ECONOMY  (MILES/ GAL)

CARBON               13.54
WEIGHT               13.60
% DIFFERENCE      0.5
```

```
                    *** [illegible] ***

                  *** IDENTIFICATION ***

TEST DATE: 9-16-75
VEHICLE:  FIV 24                  DRIVER: LOPPI
MATERIAL: GEM DINE                TEST MILES: 3000

COMMENTS:      PLATED VACUUM SPARK DELAY -- 12 BIRC
               506.1 SEC 29 DEGREE C
```

.302 ORIFICE

```
                    *** TEST DATA ***

TEMP: 67  F (WET)              PRESS: 741.785  MM HG (BARO)
      80  F (DRY)                      26.871  IN HG (VACUUM)
      99  F (MIX)                      25.2  IN. H2O (INLET)
RH:  50  %                             19.25  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3013
CC FUEL: 1937                  BLOWER RPM (CAL): 928.516
                               BLOWER RPM (ACT): 928.[illegible]

                 BAG
              AIR      [illegible]

TIME (SEC)          506.4
BLOWER REVS         7[illegible]
CO (PPM)         18.00  1877.00
HC (PPM C)        9.20   286.40
NOX (PPM)         0.71    54.60
CO2 (%)           0.04     2.05

               *** CALCULATED RESULTS ***

                 BAG

VMIX (CF)          2037.08
DF                 5.93948

CORRECTED CONCENTRATIONS

NOX (PPM)            54.01
HC (PPM C)          278.75
CO  (PPM)          1757.78
CO2 (%)               2.02

MASS EMISSIONS  (GRAMS/MILE)

NOX                   1.69
HC                    2.58
CO                   32.12
CO2                 596.76

FUEL ECONOMY  (MILES/GAL)

CARBON               13.51
WEIGHT               13.11
% DIFFERENCE     -3.1
```

```
                    *** [illegible] BAG 1 ***

                  *** IDENTIFICATION ***

TEST DATE: 9-18-75
VEHICLE:  FIV 24                   DRIVER: LARRY
MATERIAL: GAS NO NE                 TEST MILES: 3000

COMMENTS:         EGR 1220 .398ORIFICE 12 DEG. BTDC  505.6 SEC. 22 [illegible]
                  PORTED VAC. WITH SPARK DELAY VALVE

                     *** TEST DATA ***

TEMP: 67  F (WET)                  PRES: 741.985  MM HG (BARO)
      77  F (DRY)                         23.756  MM HG (VAPOR)
      100  F (MIX)                        25.2  IN. H2O (INLET)
RH:  59  %                                19.25  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3013
CC FUEL: 1053                      BLOWER RPM (CAL): 928.516
                                   BLOWER RPM (ACT): 928.362


                    BAG
                 AIR     EX

TIME (SEC)          505.6
BLOWER REVS         7823
CO (PPM)         11.00  1679.00
HC (PPM C)        8.24   233.20
NOX (PPM)         0.67    49.60
CO2 (%)           0.04     2.14

                 *** CALCULATED RESULTS ***

                 BAG

VMIX (CF)         2032.1
DF                5.77312

CORRECTED CONCENTRATIONS

NOX (PPM)           49.05
HC (PPM C)         226.39
CO  (PPM)         1568.92
CO2 (%)              2.11

MASS EMISSIONS  (GRAMS/MILE)

NOX                  1.57
HC                   2.09
CO                  29.28
CO2                621.95

FUEL ECONOMY  (MILES/GAL)

CARBON              13.15
WEIGHT              12.91
% DIFFERENCE     -1.9
```

```
                    *** TEST NO. 1 ***

                 *** IDENTIFICATION ***

TEST DATE: 9-1[illegible]-75
VEHICLE: [illegible]              DRIVER: [illegible]
[illegible]: [illegible]          TEST MILES: 3000

COMMENTS:       [illegible] 1220 -- .328 ORIFICE
                FIXED VACUUM - NO SPARK DELAY  505.7 SEC 27 C

                    *** TEST DATA ***

TEMP: 67  F (WET)                 PRES: 741.[illegible]85  MM HG (BARO)
      77  F (DRY)                       23.756  MM HG (VAPOR)
      98  F (MIX)                       25.2  IN. H2O (INLET)
RH:  5[illegible]  %                    19.25  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: [illegible] III             CF/REV: .3013
CC FUEL: 1064                     BLOWER RPM (CAL): [illegible]28.516
                                  BLOWER RPM (ACT): [illegible]

                  BAG
              AIR      EX

TIME (SEC)           505.6
BLOWER REVS          7[illegible]
CO (PPM)           13.00  1631.00
HC (PPM C)         14.24   246.00
NOX (PPM)           0.70    52.70
CO2 (%)             0.04     2.23

               *** CALCULATED RESULTS ***

                BAG

VMIX (CF)           2039.12
DF                  5.56573

CORRECTED CONCENTRATIONS

NOX (PPM)             52.13
HC (PPM C)           233.23
CO  (PPM)           1519.44
CO2 (%)                2.20

MASS EMISSIONS  (GRAMS/MILE)

NOX                   1.67
HC                    2.17
CO                   28.45
CO2                 650.83

FUEL ECONOMY  (MILES/GAL)

CARBON               12.63
WEIGHT               12.77
% DIFFERENCE        1.1

RUNNING TIME: 2.1 UNITS
READY
```

```
                    *** [illegible] BAG 1 ***

                    *** IDENTIFICATION ***

TEST DATE: 9-19-75
VEHICLE:  RIV 24                         DRIVER: SIKES
MATERIAL: GEM NONE                       TEST MILES: 3000

COMMENTS:          .32% DEVICE FITTED VAC ADV 12 DEG
                   96 C REPEAT OF TEST 17

                     *** TEST DATA ***

TEMP: 66   F (WET)                      PRES: 744.[illegible]5  MM HG (BARO)
      80   F (DRY)                            26.871  MM HG (VAPOR)
      92   F (MIX)                            25.2  IN. H2O (INLET)
RH:  47  %                                    18.9  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS                   BLOWER SPEED:  3
FUEL: RO III                            CF/REV: .3007
CC FUEL: 1080                           BLOWER RPM (CAL): 9[illegible].554
                                        BLOWER RPM (ACT): 9[illegible].[illegible]67

                    BAG
                  AIR     EXH

TIME (SEC)          505.4
BLOWER REVS         7825
CO (PPM)         17.60  1846.00
HC (PPM C)        9.72   257.24
NOX (PPM)         0.77    50.65
CO2 (%)           0.04     2.18

                *** CALCULATED RESULTS ***

                 BAG

VMIX (CF)          2065.13
DF                 5.63078

CORRECTED CONCENTRATIONS

NOX (PPM)            54.02
HC (PPM C)          2[illegible].35
CO  (PPM)          1726.25
CO2 (%)               2.15

MASS EMISSIONS  (GRAMS/MILE)

NOX                   1.67
HC                    2.34
CO                   32.74
CO2                 644.11

FUEL ECONOMY  (MILES/GAL)

CARBON               12.62
WEIGHT               12.58
% DIFFERENCE      -0.3
```

```
                   *** THIRD BAG 1 ***
                 *** IDENTIFICATION ***

TEST DATE: 9-10-75
VEHICLE:  EIV 24                    DRIVER: GIKEK
MATERIAL: GEM NONE                  TEST MILES: 500P

COMMENTS:         .328 ORFICE 12 HIDC MAN. VAC. W/S.D.V.
 9                FUEL TEMP 26 C 982CC 506.1 SEC

                    *** TEST DATA ***

TEMP: 66  F (WET)                   PRES: 744.685  MM HG (BARO!          79

     95  F (MIX)                        25.2  IN. H2O (INLET)
RH:  50  %                              19.25  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3011
CC FUEL: 982                        BLOWER RPM (CAL): 928.516
  @                                 BLOWER RPM (ACT): 928.631

                     BAG
  9               AIR     EX

TIME (SEC)           506.1
BLOWER REVS          7833
CO (PPM)          21.20  1700.00
HC (PPM C)        11.12   284.60
NOX (PPM)          1.08    92.98
CO2 (5)            0.04     1.98

                 *** CALCULATED RESULTS ***

                BAG

VMIX (CF)         2059.54
DF                6.17789

CORRECTED CONCENTRATIONS

NOX (PPM)           92.07
HC (PPM C)         275.28
CO  (PPM)         1590.27
CO2 (%)              1.95

MASS EMISSIONS  (GRAMS/MILE)

NOX                 2.87
HC                  2.58
CO                 30.08
CO2               582.34

FUEL ECONOMY  (MILES/GAL)

CCRBON             13.91
WEIGHT             13.84
% DIFFERENCE    -0.5
```

```
                    *** [illegible] ***

                    *** IDENTIFICATION ***

TEST DATE: 9-19-75
VEHICLE:   ETV 24                     DRIVER: MIKEK
MATERIAL:  GEM NONE                   TEST MILES: 3000

COMMENTS:        .398 ORIFICE 6 BTDC PORTED VAC. ADV
                 FUEL TEMP 27 C

                    *** TEST DATA ***

TEMP:  65   F (WET)                   PRES: 744.585  MM HG (BARO)
       80   F (DRY)                         26.271  MM HG (VAPOR)
       93   F (MIX)                         25.2  IN. H20 (INLET)
RH:   44  %                                 19.25  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                 BLOWER SPEED:  3
FUEL: HO III                          CF/REV: .3011
CC FUEL: 1098                         BLOWER RPM (CAL): 928.516
                                      BLOWER RPM (ACT): [illegible].557

                  BAG
               AIR     EX

TIME (SEC)         505.3
BLOWER REVS        7820
CO (PPM)       17.40  1790.00
HC (PPM C)      9.92   291.56
NOX (PPM)       0.77    48.11
CO2 (%)         0.05     2.22

              *** CALCULATED RESULTS ***

               BAG

VMIX (CF)        2063.39
DF               5.52033

CORRECTED CONCENTRATIONS

NOX (PPM)          47.48
HC (PPM C)        283.44
CO  (PPM)        1768.42
CO2 (%)             2.18

MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.43
HC                  2.66
CO                 43.51
CO2               653.12

FUEL ECONOMY  (MILES/GAL)

CARBON             12.[illegible]
WEIGHT             12.[illegible]
% DIFFERENCE     -0.4
```

```
                    *** THIRD BAG 21 ***

                  *** IDENTIFICATION ***

DEST DATE: 9-19-75
VEHICLE:  EIV 24                  DRIVER: MIKEK
MATERIAL: GEM NOE                 TEST MILES: 3000

CKMMENTS:        .348 ORFICE 6 BTDC PORTED VAC. ADV
              CARBURETOR HAD TUBE ADJUSTED RICHER?

:TH9     *** TEST DATA ***

TEMP: 66   F (WET)                PRES: 744.585  MM HG (BARO)
   -   81  F (DRY)                      27.045  MM HG (VAPEER
  9   92   F (MIX)                      25.8  IN. H20 (INLEPE
RH:  41  %                              19.25  IN. H20 (OILET)
INVERTIA WT.: 4000 LBS            BLOWER SPEED:  3
                                                 FUEL: HO 11A
CC FUEL: 1115                     BLOWER RPM (CAL): 928.51L
                                  BLOWER BPM (ACIR: 928.40J

                 BAG
              AIR     EX

THME (SEC)        505.9
BLWER REVS         7828
CO (PPM)        26.30  2797.00
H (PPM C)      10.72   273.40
NOX (PPM)        0.82    40.67
CO2 (S)          0.04     2.13

              *** CALCULATED RESULTS ***

              BAG

VMIX (CF)        2060.17
DF               5.53178

CORRECTED CONCENTRATIONS

NOX (PPM)          40.90
HC (PPM C)        264.69
CO  (PPM)        2692.04
CO2 (%)             2.10

MASS EMISSIONS  (RAMS/MILE)

NOX               1.20
                    HC                          2.54
CO               49.86
CO2             630.38

+L ECONOMY  (MILES/GAL)

CARBON           12.38
WEGHT            12.19
%"DIFFERENCE    -1.6
```

279-

```
                        *** THIRD BAG 22 ***

                       *** IDENTIFICATION ***

TEST DATE: 9-20-75
VEHICLE:  ETV 24                  DRIVER: LARRY
MATERIAL: GEM NONE                TEST MILES: 3104

COMMENTS:         .348 ORFICE 12 BTDC  PORTED VAC. ADV
                  25 C FUEL

                         * * TEST DATA * *

TEMP: 62  F (WET)                 PRES: 743.185  MM HG (BARO)
      75  F (DRY)                        22.243  MM HG (VAPOR)
      92  F (MIX)                        25.2  IN. H20 (INLET)
RH:  51  %                               19.25  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3012
CC FUEL: 1075                     BLOWER RPM (CAL): 928.516
                                  BLOWER RPM (ACT): 928.487


                       BAG
                    AIR     EX

TIME (SEC)            507.6
BLOWER REVS           7855
CO (PPM)          11.30  2337.00
HC (PPM C)        21.72  312.48
NOX (PPM)          0.47   56.29
CO2 (5)            0.04    2.06

                    **  CALCULATED RESULTS ***

                  BAG

VMIX (CF)          2072.9
DF                 5.79627

CORRECTED CONCENTRATIONS

NOX (PPM)            55.90
HC (PPM C)          294.51
CO  (PPM)          2196.63
CO2 (%)               2.03

MASS EMISSIONS  (GRAMS/MILE)

NOX                   1.69
HC                    2.78
CO                   41.82
CO2                 610.34

FUEL ECONOMY  (MILES/GAL)

CARBON               12.96
WEIGHT               12.64
% DIFFERENCE     -2.5
```

```
                         *** FILE NO. 38 ***

                       *** IDENTIFICATION ***

TEST DATE: 9-[illegible]-75
VEHICLE:  #TV [illegible]                        DRIVER: [illegible]
SERIAL: G-[illegible] [illegible]                 TEST MILES: 3104
COMMENTS:          .308 ORIFICE 12 #IDC ?AN. VAC. ADV. ?/SDV
                    26 C FUEL

                          *** TEST DATA ***

TEMP(BARO)F (TEM                       PRES: 743.1[illegible]
      75  F (DRY)                             29.243  IN HG (BARO)
      93  F (MIX)                             25.2  IN. H2O (INLET)
RH:  51  %                                    19.485  IN. H2O(OUTLET)
INERTIA WT.: 4000 LBS                  BLOWER SPEED:  3
FUEL: HO III                           CF/REV: .3014
CC FUEL: 983                           BLOWER RPM (CAL): 928.4010
                                       BLOWER RPM (ACT): 928[illegible]
                    AIR     BAG

TIME (SEC)              505.3
BLOWER REVS             7?18
CO (PPM)            15.10  2224.00
HC (PPM C)          20.20   330.08
NOX (PPM)            0.63    91.60
CO2 (%)              0.04     1.91
                    *** CALCULATED RESULTS ***

                    BAG

                      VMIX (CF)         2060.3
DF                    6.22283

CORRECTED CONCENTRATIONS

NOX (PPM)              91.07
HC (PPM C)            313.13
CO  (PPM)            2095.13
CO2 (%)                 1.88

MASS EMISSIONS  (GRAMS/MILE)

NOX                     2.73
HC                      2.94
CO                     39.62
CO2                   561.76

FUEL ECONOMY  (MILES/GAL)

CARBON                 14.01
WEIGHT                 13.83
% DIFFERENCE        -1.3
```

```
                   [illegible]

              *** [illegible] ***

TEST DATE: 9-20-75
VEHICLE:  EIV 24                  DRIVER: [illegible]
MATERIAL: GEM NONE                TEST MILES: 3112

COMMENTS:       .344 ORIFICE 12 EIDC MAN. VAC. ADV
                26 C FUEL

                    *** TEST DATA ***

TEMP: 61   F (WET)                PRES: 743.185  MM HG (BARO)
      73   F (DRY)                      30.[illegible]  IN HG (BARO)
      92   F (MIX)                      25.2  IN. H2O (INLET)
RH:   50   %                            19.25  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: NO III                      CF/REV: .3018
GC FUEL: 972                      BLOWER RPM (CAL): 928.51
                                  BLOWER RPM (ACT): [illegible]

                       BAG
                   [illegible]

TIME (SEC)             509.3
BLOWER REVS            7412
CO (PPM)            10.00  1792.00
HC (PPM C)          14.44   317.60
NOX (PPM)            0.65    17.60
CO2 (%)              0.04    1.[illegible]

              *** CALCULATED RESULTS ***

                  BAG

VMIX (CF)            2061.56
DF                   6.43742

CORRECTED CONCENTRATIONS

NOX (PPM)              17.0[illegible]
HC (PPM C)            305.40
CO  (PPM)            16[illegible]
CO2 (%)                1.[illegible]5

MASS EMISSIONS  (GRAMS/MILE)

NOX                    2.44
HC                     2.36
CO                    31.44
CO2                  552.89

FUEL ECONOMY  (MILES/GAL)

CARBON                14.49
WEIGHT                13.98
% DIFFERENCE    -3.7
```

```
                    *** THIRD BAG 25 ***

                  *** IDENTIFICATION ***

TEST DATE: 9-22-75
VEHICLE:  ETV 24                  DRIVER: LARRY
MATERIAL: GEM NONE                TEST MILES: 3121

COMMENTS:        6 DER. BTDC PORTED VAC. ADV..348 ORFICE
                 506.6 SEC. 27 DEGREE C REPEAT OF TEST # 21

                    *** TEST DATA ***

TEMP: 61  F (WET)                 PRES: 747.435  MM HG (BARO)
      79  F (DRY)                        25.509  MM HG (VAPOR)
      98  F (MIX)                        25.725  IN. H20 (INLET)
RH:  34  %                               19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3022
CC FUEL: 1096                     BLOWER RPM (CAL): 928.411
                                  BLOWER RPM (ACT): 928.425

                     BAG
                  AIR    EX

TIME (SEC)          506.6
BLOWER REVS         7839
CO (PPM)        15.00  2008.00
HC (PPM C)       6.52   290.80
NOX (PPM)        0.61    44.80
CO2 (5)          0.04     2.04

                 *** CALCULATED RESULTS ***

                BAG

VMIX (CF)       2063.17
DF              5.92976

CORRECTED CONCENTRATIONS

NOX (PPM)         44.29
HC (PPM C)       285.38
CO  (PPM)       1894.76
CO2 (%)            2.01

MASS EMISSIONS  (GRAMS/MILE)

NOX                1.24
HC                 2.68
CO                35.90
CO2              601.43

FUEL ECONOMY  (MILES/GAL)

CARBON            13.32
WEIGHT            12.40
% DIFFERENCE     -7.4

RUNNING TIME: 3.1 UNITS.
```

```
                    *** THIRD BAG 26 **

                   *** IDENTIFICATION * *

TEST DATE: 9-22-75
VEHICLE:  ETV 24                   DRIVER: LARRY
MATERIAL: GEM NONE                 TEST MILES: 3125

COMMENTS:       6 DEGREE  .328 ORFICE PORTED VAC. ADV.
                505.9 SEC. 27 DEGREE C

                      *** TEST DATA ***

TEMP: 59   F (WET)                 PRES: 747.435  MM HG (BARO)
      76   F (DRY)                       22.922  MM HG  VAPOR)
      98   F (MIX)                       25.725  IN. H20 (INLET)
RH:  34  %                               19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3022
CC FUEL: 1100                      BLOWER RPM (CAL): 928.411
                                   BLOWER RPM (ACT): 928.431

                     BAG
                   AIR    EX

TIME (SEC)           505.6
BLOWER REVS          7824
CO (PPM)         16.00  2152.00
HC (PPM C)        6.76   278.40
NOX (PPM)         0.69    42.00
CO2 (S)           0.04     1.94

                 *** CALCULATED RESULTS ***

                 BAG

VMIX (CF)         2059.22
DF                6.16761

CORRECTED CONCENTRATIONS

NOX (PPM)           41.42
HC (PPM C)         272.74
CO  (PPM)         2034.74
CO2 (%)              1.91

MASS EMISSIONS  (GRAMS/MILE)

NOX                  1.13
HC                   2.55
CO                  38.43
CO2                570.29

FUEL ECONOMY  (MILES/GAL)

CARBON              13.89
WEIGHT              12.36
% DIFFERENCE     -12.4
```

```
                    *** THIRD BAG 27 ***

                  *** IDENTIFICATION ***

TEST DATE: 9-22-75
VEHICLE:  ETV 24                DRIVER: LARRY
MATERIAL: GEM NONE              TEST MILES: 3130

COMMENTS:        12 DEGREE BTDC  .328 ORFICE  PORTED VAC ADV.
                 505.6 SEC. 27 DEGREE C

                     *** TEST DATA ***

TEMP: 61  F (WET)               PRES: 747.435  MM HG (BARO)
      78  F (DRY)                     24.617  MM HG (VAPOR)
      98  F (MIX)                     25.725  IN. H2O (INLET)
RH:  35  %                            19.775  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3022
CC FUEL: 993                    BLOWER RPM (CAL): 928.411
                                BLOWER RPM (ACT): 928.611

                      BAG
                   AIR     EX

TIME (SEC)            505.4
BLOWER REVS           7822
CO (PPM)         33.00  1661.00
HC (PPM C)       11.24  265.60
NOX (PPM)         0.92   73.40
CO2 (S)           0.12    2.02

                 *** CALCULATED RESULTS ***

                 BAG

VMIX (CF)         2058.7
DF                6.07896

CORRECTED CONCENTRATIONS

NOX (PPM)          72.63
HC (PPM C)        256.21
CO  (PPM)        1550.37
CO2 (%)             1.92

MASS EMISSIONS  (GRAMS/MILE)

NOX                 2.02
HC                  2.40
CO                 29.31
CO2               574.11

FUEL ECONOMY  (MILES/GAL)

CARBON             14.13
WEIGHT             13.69
% DIFFERENCE    -3.3
```

```
                        *** THIRD BAG #3 ***

                       *** IDENTIFICATION * *

TEST DATE: 9-22-75
VEHICLE:  ETV 24                     DRIVER: LARRY
MATERIAL: GEM NONE                   TEST MILES: 3134

COMMENTS:          12 DEG. BTDC  .328 ORFICE PORTED WITH SPARK DELAY
                   509.6 SEC. 28 DEG. C

                        *** TEST DATA ***

TEMP: 60  F (WET)                   PRES: 747.435  MM HG (BARO)
      78  F (DRY)                         24.617  MM HG (VAPOR)
      90  F (MIX)                         25.725  IN. H20 (INLET)
RH:  33  %                                19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3022
CC FUEL: 995                        BLOWER RPM (CAL): 928.411
                                    BLOWER RPM (ACT): 928.322

                      BAG
                   AIR    EX

TIME (SEC)            509.5
BLOWER REVS           7883
CO (PPM)          30.00  1803.00
HC (PPM C)         9.12  277.60
NOX (PPM)          0.92   69.60
CO2 (5)            0.04    1.95

                    *** CALCULATED RESULTS ***

                  BAG

VMIX (CF)         2104.93
DF                6.23438

CORRECTED CONCENTRATIONS

NOX (PPM)           68.83
HC (PPM C)         269.94
CO  (PPM)         1691.18
CO2 (%)              1.92

MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.94
HC                  2.58
CO                 32.69
CO2               585.99

FUEL ECONOMY  (MILES/GAL)

CARBON             13.75
WEIGHT             13.66
% DIFFERENCE   -0.6
```

```
                         *** THIRD BAG 27 ***

                       *** IDENTIFICATION ***

TEST DATE: 9-24-75
VEHICLE:  ETV 24                   DRIVER: LARRY
MATERIAL: GEM NONE                 TEST MILES: 3150

COMMENTS:        .453 ORFICE  12 BFTDC  PORTED VAC.
                 27 DEGREE C

                         *** TEST DATA ***

TEMP: 63  F (WET)                  PRES: 747.735  MM HG (BARO)
      78  F (DRY)                        24.617  MM HG (VAPOR)
      98  F (MIX)                        25.725  IN. H2O (INLET)
RH:  43  %                               19.6  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3020
CC FUEL: 1047                      BLOWER RPM (CAL): 928.428
                                   BLOWER RPM (ACT): 928.407

                        BAG
                      AIR    EX

TIME (SEC)              504.8
BLOWER REVS             7811
CO (PPM)            41.00  1879.00
HC (PPM C)           8.48  276.40
NOX (PPM)            0.64   35.80
CO2 (5)              0.04    2.00

                      *** CALCULATED RESULTS ***

                    BAG

VMIX (CF)            2055.06
DF                   6.07518

CORRECTED CONCENTRATIONS

NOX (PPM)              35.27
HC (PPM C)            269.32
CO  (PPM)            1746.79
CO2 (%)                 1.97

MASS EMISSIONS  (GRAMS/MILE)

NOX                     1.03
HC                      2.52
CO                     32.97
CO2                   587.08

FUEL ECONOMY  (MILES/GAL)

CARBON                 13.72
WEIGHT                 12.98
% DIFFERENCE   -5.7
```

```
                         *** THIRD BAG 30 * *

                        *** IDENTIFICATION ***

TEST DATE: 9-25-75
VEHICLE:  ETV 24                    DRIVER: LARRY
MATERIAL: GEM NONE                  TEST MILES: 3213

COMMENTS:         .422 ORIFICE  16 BTDC  PORTED VACUUM
                  STIFF EGR SPRING     30 DEGREE C

                          *** TEST DATA ***

TEMP: 65   F (WET)                  PRES: 744.285  MM HG (BARO)
      73   F (DRY)                         24.517  MM HG (VAPOR)
      98   F (MIX)                         25.725  IN. H2O (INLET)
RH:   49   %                               19.6  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3023
CC FUEL: 1000                       BLOWER RPM (CAL): 928.428
                                    BLOWER RPM (ACT): 928.668

                     BAG
                 AIR     EX

TIME (SEC)          504.4
BLOWER REVS         7807
CO (PPM)        13.00  1803.00
HC (PPM C)       7.44   285.60
NOX (PPM)        0.79    53.60
CO2 (5)          0.04     1.92

                     *** CALCULATED RESULTS ***

                BAG

VMIX (CF)       2045.73
DF              6.32272

CORRECTED CONCENTRATIONS

NOX (PPM)         52.93
HC   PPM C)      279.34
CO   (PPM)      1697.05
CO2   %)           1.89

MASS EMISSIONS  (GRAMS/MILE)

NOX                1.61
HC                 2.60
CO                31.88
CO2              560.56

FUEL ECONOMY  (MILES/GAL)

CARBON            14.34
WEIGHT            13.59
% DIFFERENCE    -5.5
```

```
                         *** THIRD BAG 31 ***

                       *** IDENTIFICATION ***

TEST DATE: 10-13-75
VEHICLE:   ETV 24                   DRIVER: BOB
MATERIAL: G EM 68-OB/OF              TEST MILES: 723

COMMENTS:        .422 ORIFICE .175 REAR BRK. 12 DEGREE BTDC
                 PO RTED VAC. 4 INCH SYSTEM 29 DEGREE C

                          *** TEST DATA ***

TEMP: 64   F (WET)                  PRES: 745.685  MM HG (BARO)
      80   F (DRY)                        26.271  MM HG (VAPOR)
      98   F (MIX)                        25.375  IN. H20 (INLET)
RH:  41   %                               19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3017
CC FUEL: 1123                       BLOWER RPM (CAL): 928.464
                                    BLOWER RPM (ACT): 928.472

                           BAG
                        AIR     EX

TIME (SEC)                504.7
BLOWER REVS               7810
CO (PPM)               8.20  107.00
HC (PPM C)             7.16   47.20
NOX (PPM)              0.26   16.70
CO2 (5)                0.04    2.58

                      *** CALCULATED RESULTS ***

                      BAG

VMIX (CF)             2048.5
DF                    5.16428

CORRECTED CONCENTRATIONS

NOX (PPM)              16.49
HC (PPM C)             41.43
CO  (PPM)              93.74
CO2 (%)                 2.55

MASS EMISSIONS  (GRAMS/MILE)

NOX                     0.48
HC                      0.39
CO                      1.76
CO2                   758.15

FUEL ECONOMY  (MILES/GAL)

CARBON                 11.64
WEIGHT                 12.10
% DIFFERENCE          3.8
```

```
                    *** THIRD BAG 32 ***

                   *** IDENTIFICATION ***

TEST DATE: 10-16-75
VEHICLE:   ETV 24                  DRIVER: LARRY
MATERIAL:  GEM 68-OB/OF            TEST MILES: 800

COMMENTS:        MANIFOLD VAC. .422 ORIFICE
                 GM EGR

                      *** TEST DATA ***

TEMP: 59   F (WET)                 PRES: 747.535  MM HG (BARO)
      78   F (DRY)                        24.617  MM HG (VAPOR)
      98   F (MIX)                        25.375  IN. H20 (INLET)
RH:  30  %                                19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3013
CC FUEL: 1076                      BLOWER RPM (CAL): 928.481
                                   BLOWER RPM (ACT): 928.577

                  BAG
                AIR     EX

TIME (SEC)        506
BLOWER REVS       7831
CO (PPM)       11.00   23.00
HC (PPM C)      8.20   49.20
NOX (PPM)       0.39   33.00
CO2 (5)         0.04    2.44

                 *** CALCULATED RESULTS ***

                BAG

VMIX (CF)       2056.98
DF              5.47589

CORRECTED CONCENTRATIONS

NOX (PPM)         32.68
HC (PPM C)        42.50
CO  (PPM)         12.79
CO2 (%)            2.41

MASS EMISSIONS  (GRAMS/MILE)

NOX                0.88
HC                 0.40
CO                 0.24
CO2              719.32

FUEL ECONOMY  (MILES/GAL)

CARBON            12.31
WEIGHT            12.63
% DIFFERENCE     2.6
```

```
                    *** THIRD BAG 33 ***

                  *** IDENTIFICATION ***

TEST DATE: 10-16-75
VEHICLE:   ETV 24                 DRIVER: MIKE K
MATERIAL:  GEM 68-0B/OF           TEST MILES: 805

COMMENTS:        MANIFOLD VAC. STOCK EGR
                 RAN WARM UP

                   *** TEST DATA ***

TEMP: 59   F (WET)                PRES: 747.535  MM HG (BARO)
      78   F (DRY)                      24.617  MM HG (VAPOR)
      98   F (MIX)                      25.2   IN. H20 (INLET)
RH:  30  %                              19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3011
CC FUEL: 1069                     BLOWER RPM (CAL): 928.499
                                  BLOWER RPM (ACT): 928.588

                        BAG
                     AIR     EX

TIME (SEC)              505.8
BLOWER REVS             7828
CO (PPM)             9.10   20.00
HC (PPM C)           6.76   33.16
NOX (PPM)            0.7 0  125.00
CO2 (5)              0.04    2.56

                *** CALCULATED RESULTS ***

                   BAG

VMIX (CF)          2055.49
DF                 5.22377

CORRECTED CONCENTRATIONS

NOX (PPM)           124.43
HC (PPM C)           27.69
CO  (PPM)            11.53
CO2 (%)               2.53

MASS EMISSIONS  (GRAMS/MILE)

NOX                   3.36
HC                    0.26
CO                    0.22
CO2                 754.73

FUEL ECONOMY  (MILES/GAL)

CARBON               11.74
WEIGHT               12.71
% DIFFERENCE       7.7
```

```
                       *** THIRD BAG 34 ***

                      *** IDENTIFICATION ***

TEST DATE: 10-16-75
VEHICLE:   ETV 24                    DRIVER: LARRY
MATERIAL: GEM 68-0B/0F               TEST MILES: 900

COMMENTS:         PORTED VAC. .328 ORIFICE
                  GM EGR

                       *** TEST DATA ***

TEMP: 59   F (WET)                   PRES: 747.535  MM HG (BARO)
      79   F (DRY)                         25.509  MM HG (VAPOR)
      98   F (MIX)                         25.375  IN. H20 (INLET)
RH:  28  %                                 19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                BLOWER SPEED:  3
FUEL: HO III                         CF/REV: .3013
CC FUEL: 1078                        BLOWER RPM (CAL): 928.481
                                     BLOWER RPM (ACT): 928.342

                 BAG
              AIR    EX

TIME (SEC)         504.9
BLOWER REVS        7312
CO (PPM)        9.20   20.00
HC (PPM C)      6.20   36.56
NOX (PPM)       0.87   52.10
CO2 (5)         0.04    2.44

                    *** CALCULATED RESULTS ***

                BAG

VMIX (CF)       2051.99
DF              5.47935

CORRECTED CONCENTRATIONS

NOX (PPM)         51.39
HC (PPM C)        31.49
CO  (PPM)         11.43
CO2 (%)            2.41

MASS EMISSIONS  (GRAMS/MILE)

NOX                1.38
HC                 0.29
CO                 0.22
CO2              717.57

FUEL ECONOMY  (MILES/GAL)

CARBON            12.34
WEIGHT            12.61
% DIFFERENCE     2.1
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                    ****** HWFET NO. 94 ******

                    *** IDENTIFICATION ***

DATE:6/25/75                       ROAD TEST:NA
VEHICLE:  ETV 24                   DRIVER:LARRY
MATERIAL: GEM BASELINE             TEST MILES:2301

COMMENTS:          BASELINE
                   WEIGHTED FUEL 5.835-4.145  16.90MPG

                        *** TEST DATA ****

TEMP: 71 F (WET)                   PRES: 750.635 MM HG (BARO)
      79 F (DRY)                          24.4287 IN. H2O (INLET)
      100 F (MIX)                         19.1625 IN. H2O (OUTLET)
RH: 68 %                           BLOWER SPEED: 3
INERTIA WT.:4000 LBS               BLOWER RPM (CAL): 928.923
FUEL:HO III                        BLOWER RPM (ACT): 928.419
                                   CF/REV: .2955

                       BAG
                    AIR      EX

TIME (SECS)            766.4
BLOWER REVS           11859
CO (PPM)            1.00      2.00
HC (PPM C)         14.56     24.28
CO2 (%)             0.03      3.56

                   *** CALCULATED RESULTS ***

VMIX (CF)           3066.49
DF                  3.76129

MASS EMISSIONS (GRAMS/MILE)

HC                    0.066
CO                    0.011
CO2                 549.310

FUEL ECONOMY  (MILES/GAL)

EPAMPG             16.15
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                    ****** H-FET NO. 95 ******

                    *** IDENTIFICATION ***

DATE:6/26/75                          ROAD TEST:NA
VEHICLE:  FTV 24                      DRIVER:LARRY
MATERIAL: GEM BASELINE                TEST MILES:2824

COMMENTS:         WEIGHTED FUEL 5.995-4.295  16.84MPG
                  2ND BASELINE HWFET

                       *** TEST DATA ****

TEMP:  75 F (WET)                     PRES: 749.135 MM HG (BARO)
       82 F (DRY)                               25.1026 IN. H2O (INLET)
      100 F (MIX)                               19.775 IN. H2O (OUTLET)
RH:  73 %                             BLOWER SPEED: 3
INERTIA WT.:4000 LBS                  BLOWER RPM (CAL): 928.071
FUEL:HO III                           BLOWER RPM (ACT): 928.405
                                      CF/REV: .2937

                          BAG
                      AIR       EX

TIME (SECS)              765.7
BLOWER REVS              11848
CO (PPM)              1.00      2.00
HC (PPM C)           17.44     27.40
CO2 (%)               0.03      3.63

                   *** CALCULATED RESULTS ***

VMIX (CF)          3033.36
DF                 3.68849

MASS EMISSIONS (GRAMS/MILE)

HC                    0.071
CO                    0.011
CO2                 554.078

FUEL ECONOMY   (MILES/GAL)

EPAMPG           16.01
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                    ****** HWFET NO. 96 ******

                     *** IDENTIFICATION ***

DATE:7/1/75                             ROAD TEST:NA
VEHICLE:  ETV 24                        DRIVER:MIKE K
MATERIAL: GEM BASELINE                  TEST MILES:2870VM

COMMENTS:          3RD BASELINE HWFET  FACTORY SPECS
                   WEIGHTED FUEL 5800-4135  17.19MPG

                       *** TEST DATA ****

TEMP: 74 F (WET)                       PRES: 750.995 MM HG (BARO)
      82 F (DRY)                             24.9342 IN. H20 (INLET)
     100 F (MIX)                             19.8625 IN. H20 (OUTLET)
RH: 69 %                               BLOWER SPEED: 3
INERTIA WT.:4000 LBS                   BLOWER RPM (CAL): 928.081
FUEL:HO III                            BLOWER RPM (ACT): 928.376
                                       CF/REV: .2940

                       BAG
                   AIR      EX

TIME (SECS)            766.5
BLOWER REVS            11860
CO (PPM)          11.00    20.00
HC (PPM C)        14.08    24.60
CO2 (%)            0.06     3.50

                 *** CALCULATED RESULTS ***

VMIX (CF)         3048.62
DF                3.82389

MASS EMISSIONS (GRAMS/MILE)

HC                  0.069
CO                  0.101
CO2               533.338

FUEL ECONOMY  (MILES/GAL)

EPAMPG           16.63
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                    ****** HWFET NO. 147 ******

                      *** IDENTIFICATION ***

DATE:11-18-75                      ROAD TEST:NA
VEHICLE:  ETV 24                   DRIVER:LARRY
MATERIAL: GEM NONE                 TEST MILES:5368

COMMENTS:       STOCK EVERYTHING  CARB. OFF ETV 26
                BASELINE   TEST    2253 CC = 17.16 MPG.

                        *** TEST DATA ****

TEMP: 58 F (WET)                   PRES: 753.435 MM HG (BARO)
      73 F (DRY)                         24.9342 IN. H20 (INLET)
      101 F (MIX)                        19.25 IN. H20 (OUTLET)
RH: 31 %                           BLOWER SPEED: 3
INERTIA WT.:4000 LBS               BLOWER RPM (CAL): 928.543
FUEL:HO III                        BLOWER RPM (ACT): 928.156
                                   CF/REV: .3000

                          BAG
                       AIR     EX

TIME (SECS)              766.1
BLOWER REVS             11851
CO (PPM)             19.00   25.00
HC (PPM C)            9.96   46.80
CO2 (%)               0.04    3.40

                   *** CALCULATED RESULTS ***

VMIX (CF)            3114.29
DF                   3.93309

MASS EMISSIONS (GRAMS/MILE)

HC                     0.196
CO                     0.091
CO2                  531.344

FUEL ECONOMY  (MILES/GAL)

EPAMPG               16.68
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                  ****** HWFET NO. 148 ******

                    *** IDENTIFICATION ***

DATE: 11-19-75                          ROAD TEST:NA
VEHICLE:  ETV 24                        DRIVER:LARRY
MATERIAL: GEM NONE                      TEST MILES: 5401

COMMENTS:      2ND TEST STOCK CONDITION NOTHING CHANGED FROM 1ST TEST
               2256 CC= 17.15 MPG.

                      *** TEST DATA ****

TEMP: 59 F (WET)                        PRES: 752.735 MM HG (BARO)
      78 F (DRY)                              24.6814 IN. H20 (INLET)
      102 F (MIX)                             19.3375 IN. H20 (OUTLET)
RH: 30 %                                BLOWER SPEED: 3
INERTIA WT.:4000 LBS                    BLOWER RPM (CAL): 928.56
FUEL:HO III                             BLOWER RPM (ACT): 939.444
                                        CF/REV: .2998

                         BAG
                     AIR      EX

TIME (SECS)              756
BLOWER REVS             11837
CO (PPM)            12.00    22.00
HC (PPM C)          10.96    46.00
CO2 (%)              0.04     3.40

                  *** CALCULATED RESULTS ***

VMIX (CF)           3102.12
DF                  3.9335

MASS EMISSIONS (GRAMS/MILE)

HC                     0.187
CO                     0.115
CO2                  529.267

FUEL ECONOMY   (MILES/GAL)

EPAMPG              16.74
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```
****** SHEET NO. 112 ******

*** IDENTIFICATION ***

DATE: 1-6-75
VEHICLE:  FIV 26                          ROAD TEST: 13
MATERIAL: [illegible]                     DRIVER:LANNI
                                          TEST MILES:4102

COMMENTS:       PORTED VAC. ADV. STOCK TIMING
                2320CC 793.1 SEC. 29 DEGREES C

*** TEST DATA ****

TEMP: 64 F (WET)                      PRESS: 748.435 MM HG (BARO)
      74 F (DRY)                             29.5472 IN. H20 (INLET)
      95 F (MIX)                             18.725 IN. H20 (OUTLET)
RH: 46 %                              BLOWER SPEED: 3
INERTIA [illegible]4000 LBS           BLOWER RPM (CAL): 998.63
FUEL:HO III                           BLOWER RPM (ACT): 998.673
                                      CF/REV: .[illegible]

[illegible]

TIME (SECS)             781.4
BLOWER REVS             12098
CO (PPM)           15.00     23.00
HC (PPM C)          6.66     20.20
CO2 (%)             0.04      3.47

*** CALCULATED RESULTS ***

VMIX (CF)          3187.27
DF                 3.85702

MASS EMISSIONS (GRAMS/MILE)

HC                     0.079
CO                     0.104
CO2                  555.1[illegible]

FUEL ECONOMY  (MILES/GAL)

EPAMPG            15.97
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                    ****** HWFET NO. 157 ******

                     *** IDENTIFICATION ***

DATE:12/17/75                       ROAD TEST:NA
VEHICLE:  ETV 24                    DRIVER:LARRY
MATERIAL: GEM 68 OB/OF              TEST MILES:1301

COMMENTS:          REPEAT OF PREVIOUS TEST
                   WEIGHTED FUEL=16.0 MPG

                        *** TEST DATA ****

TEMP: 56 F (WET)                    PRES: 746.585 MM HG (BARO)
      75 F (DRY)                          23.6706 IN. H2O (INLET)
      100 F (MIX)                         19.3375 IN. H2O (OUTLET)
RH: 27 %                            BLOWER SPEED: 3
INERTIA WT.:4000 LBS                BLOWER RPM (CAL): 928.662
FUEL:HO III                         BLOWER RPM (ACT): 929.372
                                    CF/REV: .2989

                        BAG
                   AIR       EX

TIME (SECS)             764
BLOWER REVS            11834
CO (PPM)          26.00    33.00
HC (PPM C)        10.52    32.80
CO2 (%)            0.06     3.53

                 *** CALCULATED RESULTS ***

VMIX (CF)        3083.89
DF               3.78924

MASS EMISSIONS (GRAMS/MILE)

HC                  0.123
CO                  0.114
CO2               544.214

FUEL ECONOMY  (MILES/GAL)

EPAMPG          16.29
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                    ****** HWFET NO. 158 ******

                      *** IDENTIFICATION ***

DATE:1-12-76                        ROAD TEST:NA
VEHICLE:  ETV 24                    DRIVER:BOB
MATERIAL: GEM 680B/OF               TEST MILES:1454

COMMENTS:      FIRST CATALYST             2362CC = 16.38 MPG
               BASELINE TEST

                         *** TEST DATA ****

TEMP: 54 F (WET)                    PRES: 747.835 MM HG (BARO)
      75 F (DRY)                          24.7657 IN. H2O (INLET)
     102 F (MIX)                          19.6 IN. H2O (OUTLET)
RH: 21 %                            BLOWER SPEED: 3
INERTIA WT.:4000 LBS                BLOWER RPM (CAL): 928.525
FUEL:HO III                         BLOWER RPM (ACT): 928.342
                                    CF/REV: .3007

                      BAG
                  AIR      EX

TIME (SECS)          765.3
BLOWER REVS          11841
CO (PPM)        95.70    99.00
HC (PPM C)      19.88    39.16
CO2 (%)          0.06     3.36

                   *** CALCULATED RESULTS ***

VMIX (CF)       3089.45
DF              3.9726

MASS EMISSIONS (GRAMS/MILE)

HC                 0.120
CO                 0.207
CO2              518.492

FUEL ECONOMY  (MILES/GAL)

EPAMPG          17.09
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                    ****** HWFET NO. 159 ******

                     *** IDENTIFICATION ***

DATE:1-13-76                       ROAD TEST:NA
VEHICLE:  ETV 24                   DRIVER:MIKE E
MATERIAL: GEM 68-0B/0F             TEST MILES:1485

COMMENTS:        2ND CATALYST BASELINE TEST
                 2347 CC = 16.48 MPG.

                        *** TEST DATA ****

TEMP: 59 F (WET)                   PRES: 732.485 MM HG (BARO)
      78 F (DRY)                         24.0075 IN. H2O (INLET)
      100 F (MIX)                        19.1625 IN. H2O (OUTLET)
RH: 28 %                           BLOWER SPEED: 3
INERTIA WT.:4000 LBS               BLOWER RPM (CAL): 928.645
FUEL:HO III                        BLOWER RPM (ACT): 928.443
                                   CF/REV: .3003

                      BAG
                  AIR      EX

TIME (SECS)          764.7
BLOWER REVS          11833
CO (PPM)         15.00    16.00
HC (PPM C)       15.20    33.68
CO2 (%)           0.05     3.42

                  *** CALCULATED RESULTS ***

VMIX (CF)        3032.69
DF               3.91258

MASS EMISSIONS (GRAMS/MILE)

HC                 0.108
CO                 0.036
CO2              519.356

FUEL ECONOMY  (MILES/GAL)

EPAMPG          17.07


RUNNING TIME: 1.5 UNITS
READY

BYE
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                    ****** HWFET NO. 160 ******

                     *** IDENTIFICATION ***

DATE:1-14-76                          ROAD TEST:NA
VEHICLE:   ETV 24                     DRIVER:MIKE K
MATERIAL:  GEM 68-0B/0F               TEST MILES:1510

COMMENTS:          3RD BASELINE CATALYST TEST
                   2382 CC = 16.24 MPG.

                        *** TEST DATA ****

TEMP:  57 F (WET)                     PRES:  747.635 MM HG (BARO)
       77 F (DRY)                            24.4287 IN. H20 (INLET)
      101 F (MIX)                            19.6875 IN. H20 (OUTLET)
RH:  26 %                             BLOWER SPEED: 3
INERTIA WT.:4000 LBS                  BLOWER RPM (CAL): 928.55
FUEL:HO III                           BLOWER RPM (ACT): 928.398
                                      CF/REV:  .3003

                          BAG
                      AIR      EX

TIME (SECS)              765.9
BLOWER REVS              11851
CO (PPM)             10.00    20.00
HC (PPM C)           16.04    45.20
CO2 (%)               0.04     3.43

                    *** CALCULATED RESULTS ***

VMIX (CF)            3095.91
DF                   3.89946

MASS EMISSIONS (GRAMS/MILE)

HC                      0.164
CO                      0.111
CO2                   532.923

FUEL ECONOMY  (MILES/GAL)

EPAMPG              16.63
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                       ****** HWFET NO. 171 ******

                        *** IDENTIFICATION ***

DATE:2-23-76                          ROAD TEST:NA
VEHICLE:  ETV 24                      DRIVER:BOB
MATERIAL: GEM 68-03/0F                TEST MILES:2045

COMMENTS:          RAN HWFET TO SEE WHATES - WHATES
                   2480 CC = 15.60 MPG.

                           *** TEST DATA ****

TEMP: 55 F (WET)                      PRES: 752.335 MM HG (BARO)
      80 F (DRY)                            24.0918 IN. H2O (INLET)
      100 F (MIX)                           19.5125 IN. H2O (OUTLET)
RH: 15 %                              BLOWER SPEED: 3
INERTIA WT.:4000 LBS                  BLOWER RPM (CAL): 928.602
FUEL:HO III                           BLOWER RPM (ACT): 928.408
                                      CF/REV: .2993

                          BAG
                    AIR        EX

TIME (SECS)              763.8
BLOWER REVS              11396
CO (PPM)           1.50       2.00
HC (PPM C)        47.20      45.34
CO2 (%)            0.04       3.65

                    *** CALCULATED RESULTS ***

VMIX (CF)          3126.02
DF                 3.66644

MASS EMISSIONS (GRAMS/MILE)

HC                   0.057
CO                   0.008
CO2                573.026

FUEL ECONOMY  (MILES/GAL)

EPAMPG            15.48
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                    ****** HWFET NO. 172 ******

                     *** IDENTIFICATION ***

DATE:2-24-76                          ROAD TEST:NA
VEHICLE:  ETV 24                      DRIVER:MIKE E
MATERIAL: GEM 68 OB/OF                TEST MILES:2065

COMMENTS:       2 ND TEST DUAL DIAPHRAGM VALVE
                2518 CC = 15.37 M.P.G.

                        *** TEST DATA ****

TEMP: 57 F (WET)                      PRES: 748.985 MM HG (BARO)
      80 F (DRY)                            24.0918 IN. H20 (INLET)
     100 F (MIX)                            19.25 IN. H20 (OUTLET)
RH: 20 %                              BLOWER SPEED: 3
INERTIA WT.:4000 LBS                  BLOWER RPM (CAL): 928.628
FUEL:HO III                           BLOWER RPM (ACT): 928.471
                                      CF/REV: .2992

                         BAG
                   AIR        EX

TIME (SECS)            765
BLOWER REVS           11838
CO (PPM)          5.00       6.00
HC (PPM C)       15.64      22.64
CO2 (%)           0.06       3.71

                  *** CALCULATED RESULTS ***

VMIX (CF)        3095.11
DF               3.60912

MASS EMISSIONS (GRAMS/MILE)

HC                 0.056
CO                 0.019
CO2              574.522

FUEL ECONOMY  (MILES/GAL)

EPAMPG          15.44

RUNNING TIME: 1.6 UNITS
READY
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                    ****** HWFET NO. 179 ******

                       *** IDENTIFICATION ***

DATE:3-3-76                        ROAD TEST:NA
VEHICLE:  ETV 24                   DRIVER:MIKE K
MATERIAL: GEM NONE                 TEST MILES:6513

COMMENTS:        2ND TEST BASELINE NO CATALYST
                 2555 CC = 15.15 MPG

                           *** TEST DATA ****

TEMP: 65 F (WET)                   PRES: 745.185 MM HG (BARO)
      78 F (DRY)                         23.7548 IN. H2O (INLET)
      100 F (MIX)                        19.075 IN. H2O (OUTLET)
RH: 43 %                           BLOWER SPEED: 3
INERTIA WT.:4000 LBS               BLOWER RPM (CAL): 928.68
FUEL:HO III                        BLOWER RPM (ACT): 928.57
                                   CF/REV: .2988

                       BAG
                   AIR      EX

TIME (SECS)           765.5
BLOWER REVS          11347
CO (PPM)          7.50  6800.00
HC (PPM C)        8.16  331.96
CO2 (%)           0.05    3.22

                  *** CALCULATED RESULTS ***

VMIX (CF)        3079.33
DF               3.45218

MASS EMISSIONS (GRAMS/MILE)

HC                 1.601
CO                62.240
CO2              496.431

FUEL ECONOMY  (MILES/GAL)

EPAMPG          14.81
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APPENDIX 3

EMISSIONS & FUEL CONSUMPTION TESTS - ETV 25

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                    ****** CVS 589 ******

                   *** IDENTIFICATION ***

TEST DATE: 7-8-75                  ROAD TEST: NA
VEHICLE:  ETV 25                   DRIVER: LARRY
MATERIAL: GEM NONE                 TEST MILES: 2636

COMMENTS:          6100 - 3575 = 2525 = 12.31 MPG
                   STALLED ONE MINUTE FROM END OD TEST NO REASON

                     *** TEST DATA ***

TEMP: 73  F (WET)                  PRES: 739.685  MM HG (BARO)
      80  F (DRY)                         26.271  MM HG (VAPOR)
      100  F (MIX)                        25.2  IN. H20 (INLET)
RH:  74  %                                19.25  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HC III                       CF/REV: .3015
BLOWER RPM (ACT): 927.003          BLOWER RPM (CAL): 928.516

                      BAG 1           BAG 2           BAG 3
                   AIR     EX      AIR     EX      AIR     EX

TIME (SECS)          504.7           870.5           526.8
BLOWER REVS          7808            13429           8149
CO  (PPM)         1.00  300.00    1.00    2.00    1.00  253.00
HC  (PPM C)      16.64   60.52   15.08   23.92   16.24  464.00
NOX (PPM)         1.05   55.60    0.95   24.20    0.95   52.77
CO2 (%)           0.06    2.19    0.06    1.66    0.06    2.19

                  *** CALCULATED RESULTS ***

                  BAG 1           BAG 2           BAG 3

VMIX (CF)         2022.71         3478.87         2111.05
DF                6.02499         8.05976         5.92913

CORRECTED CONCENTRATIONS

NOX (PPM)          54.72           23.37           51.98
HC  (PPM C)        46.64           10.71          450.50
CO  (PPM)         279.37            1.03          235.48
CO2 (%)             2.14            1.61            2.14

MASS EMISSIONS  (GRAMS/BAG)

NOX                 7.49            5.50            7.42
HC                  1.54            0.61           15.53
CO                 18.63            0.12           16.39
CO2              2257.33         2916.28         2356.09

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.73
HC                  1.35
CO                  2.33
CO2               697.32

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.89
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307<

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                     ****** CVS 500 ******

                    *** IDENTIFICATION ***

TEST DATE: 7-10-75                  ROAD TEST: NA
VEHICLE:  FTV 25                    DRIVER: LARRY
MATERIAL: GEM NONE                  TEST MILES: 2673

COMMENTS:         6.170 - 3780 = 2390 = 13.0 MPG
                  BASELINE TEST

                       *** TEST DATA ***

TEMP: 67  F (WET)                   PRES: 740.985  MM HG (BARO)
      79  F (DRY)                         25.509  MM HG (VAPOR)
     100  F (MIX)                         25.2875  IN. H2O (INLET)
RH:   58  %                               19.25  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3015
BLOWER RPM (ACT): 928.336           BLOWER RPM (CAL): 928.508

                    BAG 1            BAG 2            BAG 3
                 AIR     EX       AIR     EX       AIR     EX

TIME (SECS)         503              869.1            505
BLOWER REVS         7784             13446            7813
CO  (PPM)        1.00  590.00     1.00    2.00     1.00    2.00
HC  (PPM C)      7.16  120.64     7.56   18.20     6.92   27.12
NOX (PPM)        0.70   76.23     0.84   27.96     0.71   61.93
CO2 (%)          0.06    2.42     0.06    1.57     0.05    2.14

                  *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2019.93          3489.81          2027.46
DF               5.38756          8.52412          6.25321

CORRECTED CONCENTRATIONS

NOX (PPM)         75.66             27.22            61.33
HC  (PPM C)      114.81             11.53            21.31
CO  (PPM)        550.66              1.04             1.06
CO2 (%)            2.37              1.52             2.10

MASS EMISSIONS  (GRAMS/BAG)

NOX                8.84              5.49             7.19
HC                 3.79              0.66             0.71
CO                36.67              0.12             0.07
CO2             2497.75           2760.44          2218.25

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                1.79
HC                 0.36
CO                 2.12
CO2              679.85

FUEL ECONOMY  (MILES/GAL)

EPAMPG            13.04
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                    ****** CVS 592 F******

                    *** IDENTIFICATION ***

TEST DATE: 7-11-75                  ROAD TEST: NA
VEHICLE:  ETV 25                    DRIVER: LARRY
MATERIAL: GEM NONE                  TEST MILES: 2706

COMMENTS:        6055 - 3640 = 2415 = 12.83 MPG
                 BASELINE TEST       GOOD START

                    *** TEST DATA ***

TEMP: 63  F (WET)                   PRES: 741.685  MM HG (BARO)
      77  F (DRY)                         23.756  MM HG (VAPOR)
      100  F (MIX)                        25.2  IN. H2O (INLET)
RH:  45  %                                19.25  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3013
BLOWER RPM (ACT): 928.21            BLOWER RPM (CAL): 928.516

                    BAG 1             BAG 2             BAG 3
                 AIR     EX        AIR     EX        AIR     EX

TIME (SECS)         504.4             867.2             504.85
BLOWER REVS         7804              13416             7809
CO  (PPM)        1.00   345.00     1.00     2.00     1.00     2.00
HC  (PPM C)      5.40   205.96     6.48    20.64     6.00    26.08
NOX (PPM)        0.67    76.37     0.73    29.60     0.67    57.30
CO2 (%)          0.04     2.28     0.04     1.54     0.05     1.92

                 *** CALCULATED RESULTS ***

                 BAG 1             BAG 2             BAG 3

VMIX (CF)        2026.45           3483.7            2027.75
DF               5.60769           8.68858           6.96901

CORRECTED CONCENTRATIONS

NOX (PPM)          75.82             28.91             56.73
HC  (PPM C)       201.52             14.91             20.94
CO  (PPM)         333.98              1.04              1.05
CO2 (%)             2.25              1.50              1.88

MASS EMISSIONS  (GRAMS/BAG)

NOX                 7.90              5.18              5.91
HC                  6.67              0.85              0.69
CO                 59.39              0.12              0.07
CO2              2374.75           2733.49           1985.05

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.59
HC                  0.55
CO                  3.43
CO2               651.48

FUEL ECONOMY  (MILES/GAL)

EPAMPG             13.66
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                      ****** CVS 723 ******

                     *** IDENTIFICATION ***

TEST DATE: 12-9-75                 ROAD TEST: NA
VEHICLE:  ETV 25                   DRIVER: LARRY
MATERIAL: GEM 68-0V/0W             TEST MILES: ZERO

COMMENTS:        FIRST TEST WITH CATALYST
                 1 FIALSE START BAG ONE  11.59 MPG.

                      *** TEST DATA ***

TEMP: 60   F (WET)                 PRES: 739.985  MM HG (BARO)
      79   F (DRY)                        25.509  MM HG (VAPOR)
      102  F (MIX)                        23.8875  IN. H20 (INLET)
RH:  31  %                                18.8125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2990
BLOWER RPM (ACT): 928.558          BLOWER RPM (CAL): 928.693

                      BAG 1             BAG 2             BAG 3
                    AIR    EX         AIR    EX         AIR    EX

TIME (SECS)           506.6             867.9             505.9
BLOWER REVS           7841              13431             7829
CO  (PPM)          9.80  247.00    16.00   19.00     11.00   32.00
HC  (PPM C)        9.48   84.80     9.76   25.36      9.00   30.44
NOX (PPM)          0.52   32.00     0.52   22.90      0.65   27.00
CO2 (%)            0.04    2.59     0.04    1.44      0.04    2.02

                  *** CALCULATED RESULTS ***

                   BAG 1             BAG 2             BAG 3

VMIX (CF)          2015.66           3452.66           2012.57
DF                 5.11119           9.27744           6.61373

CORRECTED CONCENTRATIONS

NOX (PPM)            31.58             22.44             26.45
HC  (PPM C)          77.17             16.65             22.80
CO  (PPM)           224.41              4.15             21.19
CO2 (%)               2.56              1.40              1.99

MASS EMISSIONS  (G RAMS/BAG)

NOX                   3.05              3.71              2.55
HC                    2.54              0.94              0.75
CO                   14.91              0.47              1.41
CO2                2688.70           2528.55           2084.47

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.86
HC                    0.33
CO                    1.02
CO2                 649.71

FUEL ECONOMY  (MILES/ GAL)
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310<

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EPAMPG               13.42
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                      ****** CVS 727 ******

                     *** IDENTIFICATION ***

TEST DATE: 12-12-75               ROAD TEST: NA
VEHICLE:   ETV 25                 DRIVER: LARRY
MATERIAL:  GEM 68-OV/OW           TEST MILES: 54

COMMENTS:         2ND CVS AFTER CARB. WORK
                  CAR STARTED GOOD 1ST & 2ND TIME    11.86 MPG.

                       *** TEST DATA ***

TEMP:  57   F (WET)               PRES: 750.735  MM HG (BARO)
       73   F (DRY)                      20.815  MM HG (VAPOR)
       100  F (MIX)                      24.7625  IN. H2O (INLET)
RH:  35  %                               19.5125  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3003
BLOWER RPM (ACT): 928.371         BLOWER RPM (CAL): 928.534

                      BAG 1            BAG 2            BAG 3
                    AIR    EX        AIR    EX        AIR    EX

TIME (SECS)           505.8            865.1            506
BLOWER REVS           7826             13386            7829
CO   (PPM)          8.90  107.00    27.00   39.00    11.00   33.00
HC   (PPM C)        8.12   54.40     8.12   25.88     6.64   43.60
NOX (PPM)           0.66   40.90     0.98   25.00     0.58   39.20
CO2 (%)             0.04    2.48     0.05    1.47     0.04    2.08

                    *** CALCULATED RESULTS ***

                    BAG  1           BAG  2           BAG  3

VMIX (CF)           2054.24          3513.67          2055.02
DF                  5.36965          9.07654          6.41919

CORRECTED CONCENTRATIONS

NOX (PPM)             40.36            24.13            38.71
HC   (PPM C)          47.79            18.65            37.99
CO   (PPM)            93.52            13.70            22.12
CO2 (%)                2.45             1.43             2.05

MASS EMISSIONS  (GRAMS/BAG)

NOX                    3.90             3.98             3.74
HC                     1.60             1.07             1.28
CO                     6.33             1.59             1.50
CO2                 2621.91          2612.07          2192.94

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                    1.04
HC                     0.33
CO                     0.69
CO2                  665.26

FUEL ECONOMY  (MILES/GAL)

EPAMPG                13.21
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                          ****** CVS 733 ******

                         *** IDENTIFICATION ***

TEST DATE: 12-15-75                     ROAD TEST: NA
VEHICLE:   ETV 25                       DRIVER: MIKE K
MATERIAL:  GEM 680V/OW                  TEST MILES: 76

COMMENTS:          EGR AT VERY START OF TEST DUAL DIAPHRAGM
                   VALVE - BOTH STARTS GOOD 3900CC = 10.77 MPG

                            *** TEST DATA ***

TEMP: 62    F (WET)                     PRES: 743.285  MM HG (BARO)
      79    F (DRY)                           25.509  MM HG (VAPOR)
      100    F (MIX)                          24.675  IN. H20 (INLET)
RH:  37  %                                    19.25   IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                   BLOWER SPEED:  3
FUEL: HO III                            CF/REV: .3005
BLOWER RPM (ACT): 928.486               BLOWER RPM (CAL): 928.569

                       BAG 1              BAG 2              BAG 3
                    AIR     EX         AIR     EX         AIR     EX

TIME (SECS)            506.7              867.2              504.9
BLOWER REVS            7842               13419              7813
CO  (PPM)          6.30  238.00      12.00    14.50      8.90    31.90
HC  (PPM C)        7.76  112.76       8.44    28.08      9.08    43.44
NOX (PPM)          0.21   31.46       0.34    15.41      0.23    30.82
CO2 (%)            0.06    2.87       0.06     1.49      0.04     2.72

                         *** CALCULATED RESULTS ***

                   BAG 1               BAG 2               BAG 3

VMIX (CF)          2038.03             3487.41             2030.49
DF                 4.61516             8.96802             4.91323

CORRECTED CONCENTRATIONS

NOX (PPM)            31.30               15.11               30.64
HC  (PPM C)         106.68               20.58               36.21
CO  (PPM)           217.13                3.38               22.84
CO2 (%)               2.82                1.44                2.69

MASS EMISSIONS   (GRAMS/BAG)

NOX                   3.17                2.62                3.09
HC                    3.55                1.17                1.20
CO                   14.59                0.39                1.53
CO2                3000.37             2612.89             2846.48

WEIGHTED MASS EMISSIONS   (GRAMS/MILE)

NOX                   0.77
HC                    0.45
CO                    1.00
CO2                 736.74

FUEL ECONOMY   (MILES/GAL)
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                    ****** CVS 737 ******

                    *** IDENTIFICATION ***

TEST DATE: 12-16-75           ROAD TEST: NA
VEHICLE:  ETV 25              DRIVER: LARRY
MATERIAL: GEM 68-OV/OW        TEST MILES: 77

COMMENTS:      3 MIN. DELAY BEFORE EGR VALVE COMES ON
               SAME AS PREVIOUS TEST     11.82 MPG.

                      *** TEST DATA ***

TEMP: 59   F (WET)            PRES: 747.435  MM HG (BARO)
      79   F (DRY)                  25.509  MM HG (VAPOR)
      99   F (MIX)                  24.7625  IN. H2O (INLET)
RH:  28   %                         19.5125  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS         BLOWER SPEED:  3
FUEL: HO III                  CF/REV: .3006
BLOWER RPM (ACT): 928.457     BLOWER RPM (CAL): 928.534

                   BAG 1            BAG 2            BAG 3
                 AIR    EX        AIR    EX        AIR    EX

TIME (SECS)        504.3            867.8            506.5
BLOWER REVS        7805             13428            7837
CO  (PPM)      31.70  100.50    29.00   29.10   19.60   29.20
HC  (PPM C)    10.68   52.80    10.08   28.84    8.64   43.60
NOX (PPM)       0.44   32.30     0.59   20.30    0.47   34.80
CO2 (%)         0.04    2.23     0.04    1.42    0.06    2.20

                   *** CALCULATED RESULTS ***

               BAG 1            BAG 2            BAG 3

VMIX (CF)      2044.52          3517.47          2052.91
DF             5.96933          9.39897          6.07123

CORRECTED CONCENTRATIONS

NOX (PPM)        31.93            19.77            34.41
HC  (PPM C)      43.91            19.83            36.38
CO  (PPM)        69.13             2.36            11.48
CO2 (%)           2.20             1.38             2.15

MASS EMISSIONS  (GRAMS/BAG)

NOX               3.06             3.26             3.31
HC                1.47             1.14             1.22
CO                4.66             0.27             0.78
CO2            2342.16          2539.22          2301.64

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.85
HC                0.33
CO                0.35
CO2             647.77

FUEL ECONOMY  (MILES/GAL)

EPAMPG           13.67
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                         ****** CVS 748 ******

                        *** IDENTIFICATION ***

   TEST DATE: 1-6-76                   ROAD TEST: NA
   VEHICLE:   ETV 25                   DRIVER: LARRY
   MATERIAL:  GEM 68-OV/OW             TEST MILES: 109

   COMMENTS:        DUAL DIAPHRAGM EGR VALVE LASTED TEST ON 12-18-75
                    3582 CC = 11.72  MPG.

                           *** TEST DATA ***

   TEMP: 55   F (WET)                  PRES: 748.135  MM HG (BARO)
         79   F (DRY)                        25.509  MM HG (VAPOR)
         100  F (MIX)                        25.2  IN. H20 (INLET)
   RH:  17  %                                20.125  IN. H20 (OUTLET)
   INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
   FUEL: HO III                        CF/REV: .3019
   BLOWER RPM (ACT): 928.4             BLOWER RPM (CAL): 928.428

                         BAG 1             BAG 2             BAG 3
                       AIR    EX         AIR    EX         AIR    EX

   TIME (SECS)            505               868               505.2
   BLOWER REVS            7816              13428             7818
   CO  (PPM)          6.90  190.00      7.80    9.70      4.20   11.00
   HC  (PPM C)        7.64   87.20      7.92   26.60      7.36   38.44
   NOX (PPM)          0.49   35.00      0.64   17.50      0.66   32.00
   CO2 (%)            0.04    2.74      0.04    1.48      0.04    2.16

                        *** CALCULATED RESULTS ***

                      BAG 1             BAG 2             BAG 3

   VMIX (CF)          2052.33           3525.93           2052.85
   DF                 4.84347           9.0321            6.18968

   CORRECTED CONCENTRATIONS

   NOX (PPM)            34.61             16.93             31.45
   HC  (PPM C)          81.14             19.56             32.27
   CO  (PPM)           173.49              2.47              6.98
   CO2 (%)               2.71              1.44              2.13

   MASS EMISSIONS  (GRAMS/BAG)

   NOX                   3.12              2.62              2.83
   HC                    2.72              1.13              1.08
   CO                   11.74              0.29              0.47
   CO2                2898.62           2655.98           2276.51

   WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

   NOX                   0.74
   HC                    0.39
   CO                    0.75
   CO2                 693.33

   FUEL ECONOMY  (MILES/GAL)

   EPAMPG               12.52
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                  ****** CVS 757 ******

                  *** IDENTIFICATION ***

TEST DATE: 1-13-76            ROAD TEST: NA
VEHICLE:   ETV 25             DRIVER: MIKE K
MATERIAL:  GEM 68-OV/OW       TEST MILES: 144

COMMENTS:      FIRST TEST USING GM EGR VALVE 1221
               WITH .302 ORIFICE  1 FALSE START 3514 CC = 11.95 MPG.

                    *** TEST DATA ***

TEMP:  56   F (WET)           PRES: 743.285  MM HG (BARO)
       77   F (DRY)                 23.758  MM HG (VAPOR)
       100   F (MIX)                24.5  IN. H2O (INLET)
RH:  23  %                          19.5125  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS         BLOWER SPEED:  3
FUEL: HO III                  CF/REV: .3005
BLOWER RPM (ACT): 928.457     BLOWER RPM (CAL): 928.56

                   BAG 1          BAG 2          BAG 3
                 AIR    EX      AIR    EX      AIR    EX

TIME (SECS)        503.5          871.3          503.8
BLOWER REVS        7791           13482          7797
CO  (PPM)       4.00  224.00   3.10    4.00   2.30    3.00
HC  (PPM C)     9.08   92.80   9.64   26.20   8.12   35.92
NOX (PPM)       0.53   46.90   0.67   22.50   0.57   43.60
CO2 (%)         0.04    2.66   0.05    1.49   0.04    2.18

                 *** CALCULATED RESULTS ***

               BAG 1          BAG 2          BAG 3

VMIX (CF)      2026.29        3506.41        2027.85
DF             4.98073        8.97518        6.13588

CORRECTED CONCENTRATIONS

NOX (PPM)        46.48          21.90          43.12
HC  (PPM C)      85.54          17.63          29.12
CO  (PPM)       207.69           1.12           0.94
CO2 (%)           2.63           1.45           2.15

MASS EMISSIONS  (GRAMS/BAG)

NOX               4.25           3.46           3.94
HC                2.83           1.01           0.96
CO               13.88           0.13           0.06
CO2            2777.07        2643.36        2270.00

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               1.00
HC                0.37
CO                0.82
CO2             684.19

FUEL ECONOMY  (MILES/GAL)

EPAMPG           12.75
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                    ****** CVS 759 ******

                  *** IDENTIFICATION ***

TEST DATE: 1-14-76              ROAD TEST: NA
VEHICLE:   ETV 25               DRIVER: MIKE K
MATERIAL:  GEM 68-OV/OW         TEST MILES: 156

COMMENTS:        LAEANED OUT CHOKE
                 GOOD STARTS  11.15 MPG.

                    *** TEST DATA ***

TEMP: 56    F (WET)             PRES: 748.735  MM HG (BARO)
      77    F (DRY)                   23.756  MM HG (VAPOR)
      98    F (MIX)                   24.85   IN. H20 (INLET)
RH:   23  %                           19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3009
BLOWER RPM (ACT): 928.352       BLOWER RPM (CAL): 928.499

                    BAG 1              BAG 2              BAG 3
                 AIR     EX         AIR      EX        AIR     EX

TIME (SECS)        506.1              868.8              505.4
BLOWER REVS        7831               13442              7820
CO   (PPM)       5.80   155.00    10.00    12.00     7.60     9.00
HC   (PPM C)    12.84    78.40    13.28    29.44    17.40    50.80
NOX (PPM)        0.57    61.80     0.91    30.80     0.61    47.20
CO2 (%)          0.04     2.62     0.05     1.47     0.05     2.68

                 *** CALCULATED RESULTS ***

                BAG 1             BAG 2             BAG 3

VMIX (CF)       2060.72           3537.25           2057.83
DF              5.07106           9.09029           4.98897

CORRECTED CONCENTRATIONS

NOX (PPM)          61.34             29.99             46.71
HC  (PPM C)        68.09             17.62             36.89
CO  (PPM)         141.41              2.74              2.44
CO2 (%)             2.59              1.43              2.64

MASS EMISSIONS  (GRAMS/BAG)

NOX                 5.69              4.78              4.33
HC                  2.29              1.02              1.24
CO                  9.61              0.32              0.17
CO2              2781.12           2629.59           2833.16

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.29
HC                  0.36
CO                  0.61
CO2               725.38

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.90
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                    ****** CVS 761 ******

                  *** IDENTIFICATION ***

TEST DATE: 1-15-76             ROAD TEST: NA
VEHICLE:  ETV 25               DRIVER: MIKE E
MATERIAL: GEM 68-OV/OV         TEST MILES: 197

COMMENTS:       DUAL DIAPHRAGM VALVE  VEHICLE IS ACTUALLY SET UP FOR
                BACK PRESSURE VALVE  LEAN IDLE  3540 CC = 11.66 MPG.

                     *** TEST DATA ***

TEMP: 55  F (WET)              PRES: 749.785  MM HG (BARO)
      76  F (DRY)                     22.922  MM HG (VAPOR)
      97  F (MIX)                     25.025  IN. H20 (INLET)
RH:  22  %                            19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3011
BLOWER RPM (ACT): 928.403      BLOWER RPM (CAL): 928.481

                   BAG 1           BAG 2            BAG 3
                 AIR    EX       AIR    EX        AIR    EX

TIME (SECS)        504.9           867              505
BLOWER REVS        7813            13415            7814
CO  (PPM)       15.60  230.00  14.40   15.40     9.90   10.90
HC  (PPM C)     20.04  101.00  21.16   35.20    25.40   51.12
NOX (PPM)        0.39   31.98   0.62   21.93     0.56   24.48
CO2 (%)          0.04    2.74   0.06    1.48     0.06    2.08

                 *** CALCULATED RESULTS ***

                BAG 1           BAG 2           BAG 3

VMIX (CF)        2062.9          3542.02         2063.16
DF               4.83454         9.02354         6.42331

CORRECTED CONCENTRATIONS

NOX (PPM)         31.67           21.38           24.01
HC  (PPM C)       85.11           16.38           29.67
CO  (PPM)        203.95            2.14            2.09
CO2 (%)            2.71            1.43            2.03

MASS EMISSIONS  (GRAMS/BAG)

NOX                2.91            3.38            2.21
HC                 2.37            0.95            1.00
CO                13.87            0.25            0.14
CO2             2913.57         2635.25         2183.45

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.79
HC                 0.37
CO                 0.84
CO2              684.35

FUEL ECONOMY  (MILES/GAL)

EPAMPG            12.63
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                    ****** CVS 764 ******

                    *** IDENTIFICATION ***

TEST DATE: 1/17/76                 ROAD TEST: NA
VEHICLE:   ETV 25                  DRIVER: MIKE K
MATERIAL:  GEM 68 OV/OW            TEST MILES: 245

COMMENTS:         IDLE READJUSTED  ANTI-STALL ADDED
                  120 SECOND PA AND RETARD

                       *** TEST DATA ***

TEMP: 62   F (WET)                 PRES: 748.645  MM HG (BARO)
      73   F (DRY)                       20.815  MM HG (VAPOR)
      98   F (MIX)                       24.9375  IN. H2O (INLET)
RH:   53   %                             19.775  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3011
BLOWER RPM (ACT): ~~3450.8~~       BLOWER RPM (CAL): 928.49

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          507.1           ~~362.0~~          ~~363~~
BLOWER REVS          7845             13457             7840
CO   (PPM)       1.00  155.00     5.00    6.00     3.00   72.00
HC   (PPM C)    11.48   69.96    11.88   26.36    12.20   38.36
NOX (PPM)        0.56   35.25     0.43   21.70     0.53   27.90
CO2 (%)          0.05    2.65     0.06    1.46     0.05    2.15

                   *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)       2054.54          3541.43          2063.23
DF              5.01602          9.15795          6.20194

CORRECTED CONCENTRATIONS

NOX (PPM)         34.80            21.32            27.46
HC   (PPM C)      60.77            15.78            28.13
CO   (PPM)       143.65             1.35            65.31
CO2 (%)            2.61             1.41             2.11

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.72             3.91             2.93
HC                 2.05             0.91             0.95
CO                 9.78             0.16             4.44
CO2             2810.05          2597.70          2268.22

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.96
HC                 0.31
CO                 0.92
CO2              679.85

FUEL ECONOMY  (MILES/GAL)

EPAMPG            12.77
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****** CVS 765 ******

*** IDENTIFICATION ***

TEST DATE: 1-19-76                 ROAD TEST: NA
VEHICLE:  ETV 25                   DRIVER: MIKE K
MATERIAL: GEM 68-0V/0W             TEST MILES: 256

COMMENTS:       ANTI STALL ADDEXD
                120 SEC. P.A. RETARD  11.83 MPG.

*** TEST DATA ***

TEMP: 53  F (WET)                  PRES: 952.935  MM HG (BARO)
      75  F (DRY)                        22.243  MM HG (VAPOR)
      100  F (MIX)                       25.025  IN. H20 (INLET)
RH:  18  %                               19.95  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .2879
BLOWER RPM (ACT): 928.522          BLOWER RPM (CAL): 928.464

                       BAG 1            BAG 2             BAG 3
                    AIR     EX       AIR     EX        AIR     EX

TIME (SECS)           507.8            867.5             510.6
BLOWER REVS           7858             13425             7902
CO  (PPM)          3.10  194.00    4.50     5.00    3.80     4.00
HC  (PPM C)       15.40   84.80   16.24    30.28   14.24    44.00
NOX (PPM)          0.41   38.10    0.56    25.60    0.46    31.60
CO2 (%)            0.04    2.63    0.04     1.46    0.04     2.16

*** CALCULATED RESULTS ***

                  BAG 1            BAG 2             BAG 3

VMIX (CF)         2543.83          4346.01           2558.08
DF                5.04369          9.15606           6.19

CORRECTED CONCENTRATIONS

NOX (PPM)          37.77            25.10             31.21
HC  (PPM C)        72.45            15.81             32.06
CO  (PPM)         180.58             0.85              0.64
CO2 (%)             2.60             1.42              2.13

MASS EMISSIONS  (GRAMS/BAG)

NOX                 4.11             4.67              3.42
HC                  3.01             1.12              1.34
CO                 15.15             0.12              0.05
CO2              3446.44          3228.25           2836.78

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.12
HC                  0.42
CO                  0.89
CO2               843.63

FUEL ECONOMY  (MILES/GAL)

EPAMPG             10.31
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                         ****** CVS 766 ******

                         *** IDENTIFICATION ***

TEST DATE: 1/20/76                   ROAD TEST: NA
VEHICLE:   ETV 25                    DRIVER: MIKE K
MATERIAL:  GEM 63 OV/OW              TEST MILES: 270

COMMENTS:        2MIN 15SEC PA TIME
                 11.49MPG

                          *** TEST DATA ***

TEMP: 57   F (WET)                   PRES: 749.035  MM HG (BARO)
      78   F (DRY)                         24.617  MM HG (VAPOR)
      100  F (MIX)                         25.025  IN. H20 (INLET)
RH:  24  %                                 19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS                BLOWER SPEED:  3
FUEL: HO III                         CF/REV: .3012
BLOWER RPM (ACT): 928.472            BLOWER RPM (CAL): 928.481

                    BAG 1             BAG 2             BAG 3
                 AIR     EX        AIR     EX        AIR     EX

TIME (SECS)         508.3             866.3             508.3
BLOWER REVS         7866              13405             7866
CO  (PPM)        2.80   143.00     6.90     7.90     4.50    34.00
HC  (PPM C)     46.40    96.80    46.00    62.00    54.80    74.80
NOX (PPM)        0.45    36.00     0.85    15.20     0.57    27.50
CO2 (%)          0.05     2.80     0.05     1.55     0.05     2.24

                      *** CALCULATED RESULTS ***

                  BAG 1             BAG 2              BAG 3

VMIX (CF)         2063.96           3517.35            2063.96
DF                4.74656           8.60651            5.95368

CORRECTED CONCENTRATIONS

NOX (PPM)          35.64             14.45              27.03
HC  (PPM C)        60.18             21.34              29.20
CO  (PPM)         131.99              1.55              28.53
CO2 (%)             2.76              1.51               2.20

MASS EMISSIONS  (GRAMS/BAG)

NOX                 3.35              2.31               2.54
HC                  2.03              1.23               0.98
CO                  3.98              0.18               1.94
CO2              2971.32           2762.10            2366.26

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.69
HC                  0.35
CO                  0.69
CO2               718.47

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.11
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                    ****** CVS 767 ******

                    *** IDENTIFICATION ***

TEST DATE: 1-21-76                ROAD TEST: NA
VEHICLE:  ETV 25                  DRIVER: MIKE K
MATERIAL: GEM 68-0V/0W            TEST MILES: 281

COMMENTS:          1 STALL ON COLD START
                   2 MIN. 15 SEC. P.A.    11.74 MPG.

                      *** TEST DATA ***

TEMP: 54   F (WET)                PRES: 740.385  MM HG (BARO)
      76   F (DRY)                      22.922  MM HG (VAPOR)
      100  F (MIX)                      24.675  IN. H20 (INLET)
RH:  19  %                              19.6   IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3011
BLOWER RPM (ACT): 928.319         BLOWER RPM (CAL): 928.534

                    BAG 1            BAG 2            BAG 3
                 AIR     EX       AIR     EX       AIR     EX

TIME (SECS)         506.9            868.6            507
BLOWER REVS         7844             13439            7843
CO  (PPM)        2.20  241.00    6.70     7.00    6.90   52.00
HC  (PPM C)     21.20   92.00   22.68    35.56   23.20   44.40
NOX (PPM)        0.46   33.10    0.55    15.10    0.54   26.90
CO2 (%)          0.04    2.70    0.04     1.52    0.04    2.23

                  *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2034.58          3485.82          2034.33
DF               4.90501          8.79132          5.93379

CORRECTED CONCENTRATIONS

NOX (PPM)          32.73            14.61            26.45
HC  (PPM C)        75.12            15.46            25.08
CO  (PPM)         225.25             0.85            43.74
CO2 (%)             2.67             1.48             2.20

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.93             2.24             2.37
HC                  2.50             0.88             0.83
CO                 15.11             0.10             2.93
CO2              2831.01          2698.70          2330.45

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.65
HC                  0.32
CO                  1.10
CO2               699.25

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.46
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                    ****** CVS 772 ******

                  *** IDENTIFICATION ***

   TEST DATE: 1-22-76                ROAD TEST: NA
   VEHICLE:   ETV 25                 DRIVER: MIKE K
   MATERIAL: GEM 68-0V/0W            TEST MILES: 293

   COMMENTS:        PORT AIR 135 SEC.  RETARD 165 SEC.
                    11.75 MPG.

                     *** TEST DATA ***

   TEMP: 55   F (WET)                PRES: 746.085  MM HG (BARO)
         78   F (DRY)                      24.617  MM HG (VAPOR)
         98   F (MIX)                      25.1125  IN. H20 (INLET)
   RH:  18  %                              19.8625  IN. H20 (OUTLET)
   INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
   FUEL: HO III                      CF/REV: .3016
   BLOWER RPM (ACT): 928.596         BLOWER RPM (CAL): 928.464

                      BAG 1            BAG 2            BAG 3
                   AIR     EX       AIR     EX       AIR     EX

   TIME (SECS)       506.2            868.4            505.4
   BLOWER REVS       7834             13441            7821
   CO  (PPM)      26.00  176.00   27.00   28.00   18.00   46.00
   HC  (PPM C)    33.00   80.80   33.08   46.40   27.72   47.60
   NOX (PPM)       0.67   34.50    0.74   15.40    0.48   28.30
   CO2 (%)         0.04    2.69    0.04    1.48    0.04    2.23

                 *** CALCULATED RESULTS ***

                  BAG 1            BAG 2            BAG 3

   VMIX (CF)      2056.94          3529.14          2053.52
   DF             4.93615          9.00935          5.98445

   CORRECTED CONCENTRATIONS

   NOX (PPM)        33.97            14.74            27.90
   HC  (PPM C)      54.49            16.99            24.51
   CO  (PPM)       145.25             3.18            28.85
   CO2 (%)           2.66             1.44             2.20

   MASS EMISSIONS  (GRAMS/BAG)

   NOX               3.08             2.29             2.52
   HC                1.83             0.98             0.82
   CO                9.85             0.37             1.95
   CO2            2851.33          2658.42          2352.46

   WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

   NOX               0.67
   HC                0.30
   CO                0.76
   CO2             696.72

   FUEL ECONOMY  (MILES/GAL)

   EPAMPG           12.48
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                    ****** CVS 773 ******

                    *** IDENTIFICATION ***

TEST DATE: 1-23-76             ROAD TEST: NA
VEHICLE:  ETV 25               DRIVER: MUIKE K
MATERIAL: GEM 68-0V/0W         TEST MILES: 312

COMMENTS:        ASHCROFT VALVE ON AND SET AT 9 INCHES OF HG
                 RICHEN CHOKE INCREASED COLD IDLE SPEED

                       *** TEST DATA ***

TEMP: 52   F (WET)             PRES: 733.485  MM HG (BARO)
      73   F (DRY)                    20.815  MM HG (VAPOR)
     100   F (MIX)                    24.675  IN. H20 (INLET)
RH:  19  %                            19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3011
BLOWER RPM (ACT): 928.439      BLOWER RPM (CAL): 928.552

                      BAG 1          BAG 2          BAG 3
                    AIR    EX      AIR    EX      AIR    EX

TIME (SECS)          505.9          869.3          505.7
BLOWER REVS          7829           13451          7825
CO   (PPM)         6.10   70.00   5.20    6.00   5.60   26.00
HC   (PPM C)      67.20   90.40  69.20   80.40  81.60   95.60
NOX (PPM)          0.46   25.00   0.63   16.20   0.57   28.00
CO2 (%)            0.04    2.29   0.04    1.53   0.05    2.20

                  *** CALCULATED RESULTS ***

                    BAG 1          BAG 2          BAG 3

VMIX (CF)          2024.67        3478.59        2023.64
DF                 5.81171        8.70911        6.05777

CORRECTED CONCENTRATIONS

NOX (PPM)            25.62          15.64          27.52
HC  (PPM C)          34.76          19.15          27.47
CO  (PPM)            61.47           1.21          20.09
CO2 (%)               2.26           1.49           2.16

MASS EMISSIONS  (GRAMS/BAG)

NOX                   2.26           2.37           2.43
HC                    1.15           1.09           0.91
CO                    4.10           0.14           1.34
CO2                2382.97        2711.31        2277.66

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   0.63
HC                    0.28
CO                    0.36
CO2                 671.23

FUEL ECONOMY  (MILES/GAL)

EPAMPG               13.33
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                    ****** CVS 776 ******

                   *** IDENTIFICATION ***

TEST DATE: 1-27-76              ROAD TEST: NA
VEHICLE:   ETV 25               DRIVER: MIKE K
MATERIAL: GEM 68-0V/0W          TEST MILES: 344

COMMENTS:       1ST CATALYST BASELINE TEST  HIGH BACKGROUND
                HC NOT SURE WHY ?      3615 CC = 11.62 MPG.

                     *** TEST DATA ***

TEMP: 55   F (WET)              PRES: 754.385  MM HG (BARO)
      76   F (DRY)                     22.922  MM HG (VAPOR)
      99   F (MIX)                     25.025  IN. H20 (INLET)
RH:  22  %                             19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3007
BLOWER RPM (ACT): 928.496       BLOWER RPM (CAL): 928.481

                    BAG 1            BAG 2             BAG 3
                 AIR    EX        AIR    EX         AIR     EX

TIME (SECS)        507.4            867.7             507.3
BLOWER REVS        7852             13444             7834
CO  (PPM)       3.20  262.00    5.70     6.70     3.90     5.00
HC  (PPM C)    73.76  126.56   79.92    85.60    93.44   109.68
NOX (PPM)       0.51   34.06    0.77    15.72     0.56    29.29
CO2 (%)         0.06    2.75    0.08     1.50     0.05     2.25

                  *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)       2076.82          3555.83          2072.06
DF              4.80755          8.87884          5.92542

CORRECTED CONCENTRATIONS

NOX (PPM)         33.66            15.04            28.82
HC  (PPM C)       68.14            14.68            32.01
CO  (PPM)        243.75             1.44             1.53
CO2 (%)            2.70             1.43             2.21

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.12             2.38             2.66
HC                 2.31             0.85             1.08
CO                16.69             0.17             0.10
CO2             2926.96          2649.95          2386.39

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.70
HC                 0.33
CO                 0.99
CO2              702.50

FUEL ECONOMY  (MILES/GAL)

EPAMPG            12.31
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                   ****** CVS 777 ******

                  *** IDENTIFICATION ***

TEST DATE: 1/28/76               ROAD TEST: NA
VEHICLE:   ETV 25                DRIVER: MIKE K
MATERIAL: GEM 68 OV/OW           TEST MILES: 376

COMMENTS:        TRACE AFTER GETTER (D-GIN)  2ND TEST
                 (BASELINE CATALYST)  HI HC BACKGROUND  3643CC=11.53MPG

                     *** TEST DATA ***

TEMP: 54   F (WET)               PRES: 748.835  MM HG (BARO)
      76   F (DRY)                     22.922  MM HG (VAPOR)
      100  F (MIX)                     25.025  IN. H20 (INLET)
RH:  19  %                             19.6875  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3011
BLOWER RPM (ACT): 928.495        BLOWER RPM (CAL): 928.49

                     BAG 1               BAG 2               BAG 3
                   AIR     EX          AIR     EX          AIR     EX

TIME (SECS)          507.1               866                 505.1
BLOWER REVS          7847                13401               7817
CO   (PPM)        7.80  484.00     7.80     8.10     5.40    22.00
HC   (PPM C)    103.80  169.08   103.32   112.20   118.40   124.28
NOX (PPM)         0.63   34.34     0.51    15.99     0.53    29.01
CO2 (%)           0.05    2.88     0.06     1.51     0.06     2.20

                  *** CALCULATED RESULTS ***

                 BAG 1               BAG 2               BAG 3

VMIX (CF)        2057.88             3514.42             2050.01
DF               4.55422             8.8042              6.05097

CORRECTED CONCENTRATIONS

NOX (PPM)          33.85               15.54               28.57
HC  (PPM C)        88.07               20.62               25.45
CO  (PPM)         448.15                0.94               16.45
CO2 (%)             2.84                1.46                2.15

MASS EMISSIONS  (GRAMS/BAG)

NOX                 3.06                2.40                2.57
HC                  2.96                1.18                0.85
CO                 30.41                0.11                1.11
CO2              3048.89             2670.00             2298.43

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.69
HC                  0.39
CO                  1.84
CO2               7 05.48

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.19
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                    ****** C/S 179 ******

                    *** IDENTIFICATION ***

TEST DATE: 1-29-76                  ROAD TEST: NA
VEHICLE:   ETV 25                   DRIVER: MIKE E
MATERIAL:  GEM 68 OV/OV             TEST MILES: 409

COMMENTS:        3RD CATALYST BASELINE - HI  HC BACKGROUNDS?
                 DRIVER AFTER PTX TRACE MADE     3672 CC = 11.44 MPG

                       *** TEST DATA ***

TEMP: 56   F (WET)                  PRES: 739.635  MM HG (BARO)
      74   F (DRY)                        21.453  MM HG (VAPOR)
      100   F (MIX)                       24.7625  IN. H20 (INLET)
RH:  29  %                                19.3375  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3010
BLOWER RPM (ACT): 928.826           BLOWER RPM (CAL): 928.552

                     BAG 1            BAG 2            BAG 3
                  AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          505.5            867.4            505.6
BLOWER REVS          7824             13425            7831
CO   (PPM)       5.30  342.00     6.20     7.00    4.30     5.00
HC   (PPM C)    62.60  127.16    51.64    69.72   47.68    74.24
NOX  (PPM)       0.45   34.47     0.44    14.53    0.64    28.21
CO2  (%)         0.06    3.01     0.04     1.48    0.05     2.24

                   *** CALCULATED RESULTS ***

                 BAG 1              BAG 2              BAG 3

VMIX (CF)       2025.73            3475.91            2027.55
DF              4.38681            9.00752            5.96113

CORRECTED CONCENTRATIONS

NOX (PPM)         34.12              14.14              27.68
HC  (PPM C)       78.83              23.81              34.56
CO  (PPM)        314.93               1.27               1.19
CO2 (%)            2.96               1.44               2.20

MASS EMISSIONS  (GRAMS/BAG)

NOX                3.17               2.26               2.58
HC                 2.61               1.35               1.14
CO                21.03               0.15               0.08
CO2             3130.39            2618.32            2324.50

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.33
HC                 0.42
CO                 1.23
CO2              705.23

FUEL ECONOMY  (MILES/GAL)

EPAMPG            12.13
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                    ****** CVS 792 ******

                   *** IDENTIFICATION ***

TEST DATE: 2-13-76                 ROAD TEST: NA
VEHICLE:  ETV 25                   DRIVER: MIKE K
MATERIAL: GEM 68-OV/OV             TEST MILES: 747

COMMENTS:       CAR WAS RUN LIKE THE LAST
                TEST AT EPA

                      *** TEST DATA ***

TEMP: 57  F (WET)                  PRES: 745.935  MM HG (BARO)
      74  F (DRY)                        21.453  MM HG (VAPOR)
      100  F (MIX)                       24.5875  IN. H20 (INLET)
RH:  33  %                               19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3003
BLOWER RPM (ACT): 928.482          BLOWER RPM (CAL): 928.56

                    BAG 1            BAG 2            BAG 3
                 AIR     EX       AIR     EX       AIR     EX

TIME (SECS)         506.3            867.9            507
BLOWER REVS         7835             13430            7846
CO  (PPM)        1.00  215.00     1.00    2.00     1.00   29.00
HC  (PPM C)     21.04   80.80    26.35   46.40    37.04   82.40
NOX (PPM)        0.72   30.10     0.64   10.90     0.58   25.20
CO2 (%)          0.04    2.88     0.05    1.54     0.04    2.22

                  *** CALCULATED RESULTS ***

                  BAG 1             BAG 2            BAG 3

VMIX (CF)        2043.79           3503.27          2046.56
DF               4.60773           8.67403          6.00632

CORRECTED CONCENTRATIONS

NOX (PPM)          29.54             10.33            24.72
HC  (PPM C)        64.33             23.08            51.53
CO  (PPM)         200.01              1.04            26.63
CO2 (%)             2.85              1.50             2.19

MASS EMISSIONS  (GRAMS/BAG)

NOX                 2.83              1.70             2.37
HC                  2.15              1.32             1.72
CO                 13.48              0.12             1.80
CO2              3036.23           2732.70          2333.90

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.57
HC                  0.43
CO                  0.93
CO2               715.31

FUEL ECONOMY  (MILES/GAL)

EPAMPG             12.10
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                    *** IDENTIFICATION ***

TEST DATE: 2-17-76                  ROAD TEST: NA
VEHICLE:   ETV 25                   DRIVER: MIKE K
MATERIAL:  GEM NONE                 TEST MILES: 3709

COMMENTS:        FIRST EMISSION BASELINE TEST - NO CATALYST
                 VEHICLE UNCHANGED FRON ANN ARBOR TESTING  3600CC = 11.67
MPG

                       *** TEST DATA ***

TEMP: 57   F (WET)                  PRES: 744.685  MM HG (BARO)
      80   F (DRY)                        26.271  MM HG (VAPOR)
      100   F (MIX)                       24.7625  IN. H2O (INLET)
RH:  20  %                                19.5125  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS               BLOWER SPEED:  3
FUEL: HO III                        CF/REV: .3008
BLOWER RPM (ACT): 928.498           BLOWER RPM (CAL): 928.534

                        BAG 1             BAG 2              BAG 3
                      AIR    EX         AIR    EX          AIR    EX

TIME (SECS)             505.8             869.1              505.2
BLOWER REVS             7829              13432              7813
CO   (PPM)         11.00 4350.00     27.00 1385.00      8.50 3500.00
HC   (PPM C)       23.16  366.00     34.28  243.20     37.56  362.00
NOX (PPM)           0.81   51.90      1.27   26.70      0.75   40.20
CO2 (%)             0.04    2.53      0.04    1.40      0.04    1.98

                   *** CALCULATED RESULTS ***

                   BAG 1             BAG 2              BAG 3

VMIX (CF)          2040.58           3500.97            2037.71
DF                 4.50026           8.59971            5.70068

CORRECTED CONCENTRATIONS

NOX (PPM)            51.27             25.58              39.58
HC  (PPM C)         347.99            212.91             331.03
CO  (PPM)          4101.54           1315.02            3337.02
CO2 (%)               2.50              1.36               1.95

MASS EMISSIONS  (GRAMS/BAG)

NOX                   4.69              4.02               3.62
HC                   11.60             12.17              11.02
CO                  275.94            151.79             224.19
CO2                2659.22           2491.52            2069.03

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                   1.08
HC                    3.12
CO                   53.10
CO2                 641.91

FUEL ECONOMY  (MILES/GAL)

EPAMPG               11.79
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                 ****** CVS 797 ******

                *** IDENTIFICATION ***

TEST DATE: 2/18/76             ROAD TEST: NA
VEHICLE:   ETV 25              DRIVER: MIKE K
MATERIAL: GEM NONE             TEST MILES: 3742

COMMENTS:       2ND BASELINE TEST NO CATALYSTS
                ANN ARBOR CARB CALIBRATION  11.4MPG

                  *** TEST DATA ***

TEMP: 61   F (WET)             PRES: 730.635  MM HG (BARO)
      79   F (DRY)                    25.509  MM HG (VAPOR)
      100  F (MIX)                    24.325  IN. H20 (INLET)
RH:  34  %                            19.25  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3010
BLOWER RPM (ACT): 928.607      BLOWER RPM (CAL): 928.605

                     BAG 1          BAG 2          BAG 3
                  AIR     EX     AIR     EX     AIR     EX

TIME (SECS)          506.3          867.3          506.7
BLOWER REVS          7837           13422          7842
CO  (PPM)        6.00 5400.00  34.00 2000.00  26.00 4200.00
HC  (PPM C)     17.32  284.40  23.56  173.72  22.00  263.08
NOX (PPM)        0.41   44.20   0.33   21.00   0.69   33.15
CO2 (%)          0.05    2.60   0.06    1.36   0.05    1.93

                *** CALCULATED RESULTS ***

                BAG 1          BAG 2          BAG 3

VMIX (CF)       2005.07        3433.97        2006.35
DF              4.27366        8.53536        5.58739

CORRECTED CONCENTRATIONS

NOX (PPM)        43.89          20.22          32.53
HC  (PPM C)     271.13         152.92         244.95
CO  (PPM)      5065.88        1895.99        3976.34
CO2 (%)           2.56           1.31           1.89

MASS EMISSIONS  (GRAMS/BAG)

NOX               4.31           3.40           3.20
HC                8.89           8.58           8.03
CO              334.89         214.66         263.05
CO2            2678.62        2340.65        1975.26

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.94
HC                2.26
CO               67.81
CO2             615.86

FUEL ECONOMY  (MILES/GAL)

EPAMPG           11.79
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323<

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                          ****** CVS 005 ******

                         *** IDENTIFICATION ***

TEST DATE: 2-19-76                 ROAD TEST: NA
VEHICLE:   ETV 25                  DRIVER: MIKE K
MATERIAL:  GEM NONE                TEST MILES: 3753

COMMENTS:      3RD BASELINETEST NO CATALYST  11.53 MPG.
               VECHICLE UNCHANGE FROM TESTING IN ANN ARBOR

                          *** TEST DATA ***

TEMP: 57   F (WET)                 PRES: 738.985  MM HG (BARO)
      79   F (DRY)                       25.509  MM HG (VAPOR)
      100  F (MIX)                       24.4125  IN. H20 (INLET)
RH:  22  %                               19.1625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3003
BLOWER RPM (ACT): 928.51           BLOWER RPM (CAL): 928.605

                     BAG 1              BAG 2              BAG 3
                  AIR     EX         AIR     EX         AIR     EX

TIME (SECS)          505.6              867.7               505
BLOWER REVS           7825              13427               7815
CO  (PPM)         3.70 4650.00     5.40 1400.00     14.00 3900.00
HC  (PPM C)      12.44  265.20    17.12  161.60     20.12  240.00
NOX (PPM)         0.45   56.90     0.66   27.70      0.74   39.50
CO2 (%)           0.04    2.66     0.04    1.39      0.06    1.84

                      *** CALCULATED RESULTS ***

                  BAG 1              BAG 2              BAG 3

VMIX (CF)        2021.54            3468.78            2018.95
DF               4.28882            8.69329            5.98905

CORRECTED CONCENTRATIONS

NOX (PPM)          56.55              27.12              38.83
HC  (PPM C)       255.66             146.45             223.24
CO  (PPM)        4376.04            1347.85            3722.57
CO2 (%)             2.63               1.35               1.79

MASS EMISSIONS  (GRAMS/BAG)

NOX                 5.18               4.26               3.55
HC                  8.44               8.30               7.36
CO                291.66             154.15             247.79
CO2              2771.92            2450.43            1384.68

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 1.13
HC                  2.15
CO                 56.11
CO2               628.88

FUEL ECONOMY  (MILES/GAL)
                                                  330<
EPAMPG             11.91
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                    ****** CVS 007 ******

                  *** IDENTIFICATION ***

TEST DATE: 2-21-76                 ROAD TEST: NA
VEHICLE:  ETV 25                   DRIVER: MIKE K
MATERIAL: GEM NONE                 TEST MILES: 3764

COMMENTS:       4TH CATALYST CALIBRATION TEST
                WEIGHTED FUEL 11.82 MPG.

                    *** TEST DATA ***

TEMP: 58   F (WET)                 PRES: 750.085  MM HG (BARO)
      80   F (DRY)                        27.055  MM HG (VAPOR)
      100  F (MIX)                        24.675  IN. H20 (INLET)
RH:  23  %                                19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3001
BLOWER RPM (ACT): 928.417          BLOWER RPM (CAL): 928.552

                    BAG 1              BAG 2              BAG 3
                 AIR     EX         AIR     EX         AIR     EX

TIME (SECS)         505.6              867.9              504.6
BLOWER REVS         7824               13428              7809
CO  (PPM)       11.00 4200.00      11.00 1255.00      16.00 3500.00
HC  (PPM C)     16.84  240.00      27.24  158.64      24.80  244.00
NOX (PPM)        0.49   55.32       0.90   29.37       0.81   41.94
CO2 (%)          0.06    2.47       0.06    1.44       0.04    1.96

                  *** CALCULATED RESULTS ***

                BAG 1              BAG 2              BAG 3

VMIX (CF)       2051.06            3520.14            2047.12
DF              4.63522            8.4974             5.77936

CORRECTED CONCENTRATIONS

NOX (PPM)         54.94              28.58              41.27
HC  (PPM C)      226.79             134.61             223.49
CO  (PPM)       3960.54            1201.25            3328.81
CO2 (%)            2.42               1.39               1.93

MASS EMISSIONS  (GRAMS/BAG)

NOX                5.16               4.61               3.37
HC                 7.60               7.74               7.47
CO               267.82             139.42             224.67
CO2             2591.64            2546.30            2057.13

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                1.21
HC                 2.04
CO                51.02
CO2              644.44
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331<

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FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.92
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                  ****** HWFET NO. 98 ******

                    *** IDENTIFICATION ***

DATE:7-8-75                          ROAD TEST:NA
VEHICLE:  ETV 25                     DRIVER:LARRY
MATERIAL: GEM NONE                   TEST MILES:2651

COMMENTS:        5770 - 4125 = 1645 = 17.41MPG
                 BASELINE TEST RAN GOOD

                        *** TEST DATA ****

TEMP: 74 F (WET)                     PRES: 740.285 MM HG (BARO)
      82 F (DRY)                           24.513 IN. H20 (INLET)
     100 F (MIX)                           19.075 IN. H20 (OUTLET)
RH: 69 %                             BLOWER SPEED: 3
INERTIA WT.:4000 LBS                 BLOWER RPM (CAL): 928.603
FUEL:HO III                          BLOWER RPM (ACT): 928.334
                                     CF/REV: .3002

                      BAG
                   AIR      EX

TIME (SECS)            765.5
BLOWER REVS            11844
CO (PPM)           1.00     2.00
HC (PPM C)        16.76    26.72
CO2 (%)            0.04     3.73

                  *** CALCULATED RESULTS ***

VMIX (CF)        3065.67
DF               3.58975

MASS EMISSIONS (GRAMS/MILE)

HC                  0.072
CO                  0.011
CO2               574.413

FUEL ECONOMY  (MILES/GAL)

EPAMPG          15.44
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                    ****** SHEET NO. 101 ******

                      *** IDENTIFICATION ***

DATE:7-10-75                          ROAD TEST:NA
VEHICLE:  ETV 25                      DRIVER:MIKE K
MATERIAL: GEM NONE                    TEST MILES:2696

COMMENTS:         4330 - 2730 = 1600 = 17.95 MPG
                  BASELINE TEST

                         *** TEST DATA ****

TEMP: 68 F (WET)                      PRES: 738.885 MM HG (BARO)
      75 F (DRY)                            24.6814 IN. H2O (INLET)
      100 F (MIX)                           18.9875 IN. H2O (OUTLET)
RH: 70 %                              BLOWER SPEED: 3
INERTIA WT.:4000 LBS                  BLOWER RPM (CAL): 928.595
FUEL:HO III                           BLOWER RPM (ACT): 928.312
                                      CF/REV: .3005

                       -BAG-
                    AIR     EX

TIME (SECS)            766.1
BLOWER REVS            11853
CO (PPM)            1.00     2.00
HC (PPM C)         10.64    22.12
CO2 (%)             0.04     3.34

                   *** CALCULATED RESULTS ***

VMIX (CF)          3062.34
DF                 4.0091

MASS EMISSIONS (GRAMS/MILE)

HC                   0.069
CO                   0.011
CO2                513.232

FUEL ECONOMY  (MILES/GAL)

EPAMPG            17.28
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                    ****** SHEET NO. 102 ******

                      *** IDENTIFICATION ***

DATE:7-11-75                            ROAD TEST:NA
VEHICLE:  EIV 25                        DRIVER:LARRY
MATERIAL: GEM NONE                      TEST MILES:2718

COMMENTS:           5950 - 4320 = 1630 = 17.59 MPG
                    BASELINE TEST

                         *** TEST DATA ****

TEMP: 64 F (WET)                        PRES: 741.385 MM HG (BARO)
      79 F (DRY)                              24.2603 IN. H20 (INLET)
      100 F (MIX)                             19.075 IN. H20 (OUTLET)
RH: 43 %                                BLOWER SPEED: 3
INERTIA WT.:4000 LBS                    BLOWER RPM (CAL): 928.629
FUEL:HO III                             BLOWER RPM (ACT): 928.394
                                        CF/REV: .2598

                         BAG
                     AIR      EX

TIME (SECS)             773.4
BLOWER REVS            11967
CO (PPM)             1.00     2.00
HC (PPM C)           7.00    23.28
CO2 (%)              0.05     3.42

                  *** CALCULATED RESULTS ***

VMIX (CF)            3099.93
DF                   3.91525

MASS EMISSIONS (GRAMS/MILE)

HC                     0.049
CO                     0.011
CO2                  530.870

FUEL ECONOMY  (MILES/GAL)

EPAMPG             16.71
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              ****** HWFET NO. 161 ******

               *** IDENTIFICATION ***

DATE:1-14-76             ROAD TEST:NA
VEHICLE:  ETV 25         DRIVER:MIKE K
MATERIAL: GEM 68-OV/OW   TEST MILES:178

COMMENTS:   TRAIL RUN TO SEE HOW CO IS
            2313 CC = 16.7 MPG.

                   *** TEST DATA ****

TEMP: 59 F (WET)         PRES: 749.235 MM HG (BARO)
      81 F (DRY)              24.4287 IN. H2O (INLET)
      98 F (MIX)              19.95 IN. H2O (OUTLET)
RH: 26 %                 BLOWER SPEED: 3
INERTIA WT.:4000 LBS     BLOWER RPM (CAL): 928.524
FUEL:HO III              BLOWER RPM (ACT): 928.407
                         CF/REV: .3005

                  BAG
               AIR    EX

TIME (SECS)       764.6
BLOWER REVS      11831
CO (PPM)     10.00   15.00
HC (PPM C)   16.56   31.64
CO2 (%)       0.04    3.24

              *** CALCULATED RESULTS ***

VMIX (CF)    3116.51
DF           4.12999

MASS EMISSIONS (GRAMS/MILE)

HC              0.095
CO              0.064
CO2           506.401

FUEL ECONOMY (MILES/GAL)

EPAMPG       17.51
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                    ****** HWFET NO. 133 ******

                      *** IDENTIFICATION ***

DATE:1-27-76                          ROAD TEST:NA
VEHICLE:  ETV 25                      DRIVER:MIKE K
MATERIAL: GEM 68-OV/OV                TEST MILES:366

COMMENTS:       HIGH BACKGROUND HC NOT SURE WHY ?
                2336 CC = 16.56 MPG.

                         *** TEST DATA ****

TEMP: 52 F (WET)                      PRES: 754.385 MM HG (BARO)
      80 F (DRY)                            25.1026 IN. H20 (INLET)
      99 F (MIX)                            19.775 IN. H20 (OUTLET)
RH: 20 %                              BLOWER SPEED: 3
INERTIA WT.:4000 LBS                  BLOWER RPM (CAL): 928.473
FUEL:HO III                           BLOWEP RPM (ACT): 928.243
                                      CF/REV: .3008

                        BAG
                    AIR      EX

TIME (SECS)             764.8
BLOWER REVS             11832
CO (PPM)           14.00    15.00
HC (PPM C)         97.20    84.80
CO2 (%)             0.04     3.27

                   *** CALCULATED RESULTS ***

VMIX (CF)          3131.69
DF                 4.08552

MASS EMISSIONS (GRAMS/MILE)

HC                   0.057
CO                   0.035
CO2                513.641

FUEL ECONOMY  (MILES/GAL)

EPAMPG           17.27
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                    ****** HWFET NO. 164 ******

                      *** IDENTIFICATION ***

DATE:1/28/76                           ROAD TEST:NA
VEHICLE:  ETV 25                       DRIVER:MIKE K
MATERIAL: GEM 68 OV/OW                 TEST MILES:387

COMMENTS:          HI HC BACKGROUND
                   WEIGHTED FUEL  2417CC  16.01MPG

                         *** TEST DATA ****

TEMP: 53 F (WET)                       PRES: 747.835 MM HG (BARO)
      74 F (DRY)                             23.9233 IN. H20 (INLET)
      100 F (MIX)                            19.6 IN. H20 (OUTLET)
RH: 20 %                               BLOWER SPEED: 3
INERTIA WT.:4000 LBS                   BLOWER RPM (CAL): 928.61
FUEL:HO III                            BLOWER RPM (ACT): 928.534
                                       CF/REV: .2995

                        BAG
                    AIR      EX

TIME (SECS)            765.4
BLOWER REVS           11845
CO (PPM)           18.00    19.00
HC (PPM C)         48.84    47.88
CO2 (%)             0.06     3.37

                   *** CALCULATED RESULTS ***

VMIX (CF)          3096.31
DF                 3.96854

MASS EMISSIONS (GRAMS/MILE)

HC                    0.056
CO                    0.043
CO2                 521.213

FUEL ECONOMY  (MILES/GAL)

EPAMPG            17.02
```

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                 ****** HWFET NO. 165 ******

                  *** IDENTIFICATION ***

DATE:1-29-76                      ROAD TEST:NA
VEHICLE:  ETV 25                  DRIVER:MIKE E
MATERIAL: GEM 68 OV/OW            TEST MILES:431

COMMENTS:       3 RD BASELINE TEST     HI  HC
                BACKGROUNDS 7          2431 CC = 15.92 MPG

                     *** TEST DATA ****

TEMP: 56 F (WET)                  PRES: 741.585 MM HG (BARO)
      75 F (DRY)                        24.4287 IN. H20 (INLET)
     100 F (MIX)                        19.425 IN. H20 (OUTLET)
RH: 27 %                          BLOWER SPEED: 3
INERTIA WT.:4000 LBS              BLOWER RPM (CAL): 928.576
FUEL:HO III                       BLOWER RPM (ACT): 928.521
                                  CF/REV: .3005

                       BAG
                    AIR     EX

TIME (SECS)           764.7
BLOWER REVS           11834
CO (PPM)          21.60   22.00
HC (PPM C)        42.24   43.60
CO2 (%)            0.06    3.39

                 *** CALCULATED RESULTS ***

VMIX (CF)         3071.77
DF                3.94536

MASS EMISSIONS (GRAMS/MILE)

HC                  0.059
CO                  0.043
CO2               520.206

FUEL ECONOMY  (MILES/GAL)

EPAMPG           17.05
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                    ****** HWFET NO. 155 ******

                     *** IDENTIFICATION ***

DATE:2-17-76                       ROAD TEST:NA
VEHICLE:  ETV 25                   DRIVER:MIKE K
MATERIAL: GEM NONE                 TEST MILES:3730

COMMENTS:      FIRST EMISSION BASELINE TETST NO CATALYST
               VEHICLE UNCHANGE FROM ANN ARBOR TESTING  2330 CC = 16.25
MPG.

                         *** TEST DATA ****

TEMP: 58 F (WET)                   PRES: 744.685 MM HG (BARO)
      82 F (DRY)                         24.0918 IN. H20 (INLET)
      100 F (MIX)                        19.25 IN. H20 (OUTLET)
RH: 20 %                           BLOWER SPEED: 3
INERTIA WT.:4000 LBS               BLOWER RPM (CAL): 928.628
FUEL:HO III                        BLOWER RPM (ACT): 928.463
                                   CF/REV: .2995

                          BAG
                     AIR       EX

TIME (SECS)             765.2
BLOWER REVS            11841
CO (PPM)           18.00  7200.00
HC (PPM C)         40.92   492.80
CO2 (%)             0.04     2.78

                    *** CALCULATED RESULTS ***

VMIX (CF)          3080.41
DF                 3.82191

MASS EMISSIONS (GRAMS/MILE)

HC                   2.272
CO                  66.983
CO2                428.922

FUEL ECONOMY  (MILES/GAL)

EPAMPG           16.39
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APPENDIX 4

EMISSIONS & FUEL CONSUMPTION TESTS - ETV 26

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                    ****** CVS [illegible] ******

                    *** IDENTIFICATION ***

TEST DATE: 7-1-75              ROAD TEST: NO
VEHICLE:  ETV 26               DRIVER: LARRY
MATERIAL: GEM BASELINE         TEST MILES: 2922

COMMENTS:      6.095-3.550=2.545 = 12.23 MPG
               ONE STALL BAG ONE APPROX 90 SEC INTO TEST

                    *** TEST DATA ***

TEMP: 74  F (WET)              PRES: 751.785  MM HG (BARO)
      81  F (DRY)                    27.055  MM HG (VAPOR)
      100  F (MIX)                   25.9875  IN. H2O (INLET)
RH:  73  %                           19.775  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .2920
BLOWER RPM (ACT): 926.521      BLOWER RPM (CAL): 930.793

                 BAG 1           BAG 2           BAG 3
               AIR    EX       AIR    EX       AIR    EX

TIME (SECS)      510.6          [illegible]      505.2
BLOWER REVS      7902            13431            7804
CO  (PPM)      1.00  495.00    2.00   20.00    2.00  138.00
HC  (PPM C)   18.32  154.80   13.92   26.76   14.76   44.40
NOX (PPM)      0.08   65.00    1.23   16.55    0.92   45.40
CO2 (%)        0.06    2.51    0.06    1.63    0.06    2.35

                 *** CALCULATED RESULTS ***

                BAG 1            BAG 2            BAG 3

VMIX (CF)       2013.26          3921.94          1988.4
DF              5.21129          8.19791          5.66053

CORRECTED CONCENTRATIONS

NOX (PPM)        64.94            15.47            44.64
HC  (PPM C)     140.00            14.54            32.25
CO  (PPM)       457.82            17.16           126.68
CO2 (%)           2.46             1.58             2.30

MASS EMISSIONS  (GRAMS/BAG)

NOX               9.29             3.76             6.31
HC                4.60             0.81             1.05
CO               30.39             1.94             9.30
CO2            2584.39          2814.79          2385.48

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               1.51
HC                0.45
CO                2.63
CO2             704.77

FUEL ECONOMY  (MILES/GAL)

EPAMPG           12.52
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                    ****** CVS 527 ******

                  *** IDENTIFICATION ***

TEST DATE: 7/16/75               ROAD TEST: NA
VEHICLE:  ETV 26                 DRIVER: LARRY
MATERIAL: GEM NONE               TEST MILES: 3100

COMMENTS:         6150-3670= 2480= 12.53MPG
                  BASELINE TEST  ONE STALL BAG ONE

                     *** TEST DATA ***

TEMP: 68   F (WET)               PRES: 750.985  MM HG (BARO)
      86   F (DRY)                      31.824  MM HG (VAPOR)
      100  F (MIX)                     25.6375  IN. H2O (INLET)
RH:  39  %                              19.425  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
FUEL: HO III                     CF/REV: .3014
BLOWER RPM (ACT): 928.227        BLOWER RPM (CAL): 928.455

                  BAG 1            BAG 2            BAG 3
               AIR     EX       AIR     EX       AIR     EX

TIME (SECS)       504.7            867.95           504.8
BLOWER REVS       7811             13423            7811
CO  (PPM)      1.00   554.00    1.00     2.00    1.00    12.00
HC  (PPM C)    6.84   138.20    7.48    22.76    6.56    34.00
NOX (PPM)      0.71    68.81    0.97    19.40    0.65    51.75
CO2 (%)        0.04     2.39    0.04     1.62    0.04     2.22

                 *** CALCULATED RESULTS ***

               BAG 1            BAG 2            BAG 3

VMIX (CF)      2053.67          3529.18          2053.67
DF             5.45609          8.25903          6.02373

CORRECTED CONCENTRATIONS

NOX (PPM)        68.23            18.55            51.21
HC  (PPM C)     132.61            16.19            28.53
CO  (PPM)       520.73             1.04            10.51
CO2 (%)           2.36             1.58             2.19

MASS EMISSIONS  (GRAMS/BAG)

NOX               7.52             3.51             5.64
HC                4.45             0.93             0.96
CO               35.26             0.12             0.71
CO2            2524.68          2916.85          2341.87

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               1.33
HC                0.45
CO                2.09
CO2             711.64
                                     312<
FUEL ECONOMY  (MILES/GAL)

FEAMPG           12.53
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                    ****** CVS 505 ******

                   *** IDENTIFICATION ***

TEST DATE: 07-15-75            ROAD TEST: NA
VEHICLE:   ETV 26              DRIVER: LARRY
MATERIAL: GEM NONE             TEST MILES: 3076

COMMENTS:        6255 - 3770 = 2485 = 12.51 MPG
                 BASELINE     ONE STALL BAG ONE

                      *** TEST DATA ***

TEMP: 66   F (WET)             PRES: 751.585  MM HG (BARO)
      81   F (DRY)                   27.055  MM HG (VAPOR)
     100   F (MIX)                   25.55  IN. H20 (INLET)
RH:   47   %                         19.5125  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3014
BLOWER RPM (ACT): 928.968      BLOWER RPM (CAL): 928.455

                   BAG 1            BAG 2            BAG 3
                 AIR     EX       AIR     EX       AIR     EX

TIME (SECS)       505.1            866.7            505.25
BLOWER REVS       7814             13406            7842
CO   (PPM)      1.00  437.00     1.00     2.00    1.00     2.00
HC   (PPM C)    7.60  168.56     7.80    26.16    7.28    35.76
NOX (PPM)       0.49   81.97     0.81    20.75    0.77    57.04
CO2 (%)         0.05    2.45     0.05     1.62    0.06     2.30

                  *** CALCULATED RESULTS ***

                 BAG 1              BAG 2              BAG 3

VMIX (CF)       2056.28            3527.84            2063.65
DF              5.33329            8.2573             5.81657

CORRECTED CONCENTRATIONS

NOX (PPM)         81.57              20.04              56.45
HC   (PPM C)     162.39              19.30              29.73
CO   (PPM)       455.84               1.04               1.07
CO2 (%)            2.41               1.58               2.25

MASS EMISSIONS  (GRAMS/BAG)

NOX                9.08               3.83               6.30
HC                 5.45               1.11               1.00
CO                30.90               0.12               0.07
CO2             2583.70            2899.58            2421.78

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                1.51
HC                 0.54
CO                 1.79
CO2              718.80

FUEL ECONOMY  (MILES/GAL)

[illegible]
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                    ****** CVS 682 ******

                   *** IDENTIFICATION ***

    TEST DATE: 11-13-75              ROAD TEST: NA
    VEHICLE:   ETV 26                DRIVER: MIKE K
    MATERIAL:  GEM NONE               TEST MILES: 3203

    COMMENTS:         BASELINE TEST  STOCK EVERYTHING
                      11.57 MPG.

                      *** TEST DATA ***

    TEMP: 54   F (WET)               PRES: 739.9   MM HG (BARO)
          73   F (DRY)                     20.815  MM HG (VAPOR)
          103   F (MIX)                    24.5  IN. H2O (INLET)
    RH:  25  %                             19.075  IN. H2O (OUTLET)
    INERTIA WT.: 4000 LBS            BLOWER SPEED:  3
    FUEL: HO III                     CF/REV: .3003
    BLOWER RPM (ACT): 928.339        BLOWER RPM (CAL): 928.605

                      BAG 1            BAG 2            BAG 3
                   AIR     EX       AIR     EX       AIR     EX

    TIME (SECS)        506.3            868.6            507.3
    BLOWER REVS        7835             13439            7848
    CO   (PPM)    10.00  905.00   12.00   16.00    7.40   43.00
    HC   (PPM C)   5.84  233.20    8.80   33.76    6.92   56.00
    NOX (PPM)      0.71   103.00    1.21   29.00    0.92   86.60
    CO2 (%)        0.04    2.71   0.04     1.66   0.04    2.28

                  *** CALCULATED RESULTS ***

                    BAG 1           BAG 2           BAG 3

    VMIX (CF)       2015.12         3456.44         2018.46
    DF              4.75452          8.04847          5.85235

    CORRECTED CONCENTRATIONS

    NOX (PPM)       102.44          27.94           85.84
    HC   (PPM C)    228.59          26.05           50.26
    CO   (PPM)      842.65            4.94          34.68
    CO2 (%)            2.68          1.62             2.25

    MASS EMISSIONS  (GRAMS/BAG)

    NOX                9.26          4.33            7.77
    HC                 7.52          1.47            1.66
    CO                55.98          0.56            2.31
    CO2             2814.70       2929.06         2365.08

    WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

    NOX                1.70
    HC                 0.75
    CO                 3.46
    CO2              731.66

    FUEL ECONOMY  (MILES/ GAL)

    EPAMPG            11.96
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****** CVS 685 ******

*** IDENTIFICATION ***

TEST DATE: 11-14-75            ROAD TEST: NA
VEHICLE:  ETV 26               DRIVER: MIKE K.
MATERIAL: GEM NONE             TEST MILES: 3216

COMMENTS:       STOCK EVERYTHING
                BASELINE TEST  11.62 MPG.

*** TEST DATA ***

TEMP: 53   F (WET)             PRES: 743.485  MM HG (BARO)
      71   F (DRY)                   19.468  MM HG (VAPOR)
      99   F (MIX)                   24.85  IN. H20 (INLET)
RH:  27  %                           19.425  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS          BLOWER SPEED:  3
FUEL: HO III                   CF/REV: .3009
BLOWER RPM (ACT): 928.522      BLOWER RPM (CAL): 928.534

                    BAG 1          BAG 2          BAG 3
                 AIR     EX     AIR     EX     AIR     EX

TIME (SECS)         506.1          869.2          506.4
BLOWER REVS         7833           13449          7838
CO  (PPM)        7.80  1213.00  12.00   16.00   7.60   57.00
HC  (PPM C)      6.36   285.20   7.76   28.60   5.68   66.40
NOX (PPM)        0.70   107.00   1.04   26.20   0.76   83.80
CO2 (%)          0.04     2.55   0.04    1.62   0.04    2.48

*** CALCULATED RESULTS ***

                BAG 1          BAG 2          BAG 3

VMIX (CF)       2042.01        3506.06        2043.31
DF              4.97622        8.24922        5.37717

CORRECTED CONCENTRATIONS

NOX (PPM)        106.44          25.29          83.18
HC  (PPM C)      280.12          21.78          61.78
CO  (PPM)       1136.70           4.91          47.65
CO2 (%)            2.52           1.58           2.45

MASS EMISSIONS  (GRAMS/BAG)

NOX                9.75           3.98           7.63
HC                 9.34           1.25           2.06
CO                76.53           0.57           3.21
CO2             2681.48        2897.76        2607.96

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                1.67
HC                 0.86
CO                 4.71
CO2              738.31

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.79
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                    ****** CVS 783 ******

                   *** IDENTIFICATION ***

TEST DATE: 2-6-76                  ROAD TEST: NA
VEHICLE:   ETV 25                  DRIVER: MIKE K
MATERIAL:  GEM 68-PF/PG            TEST MILES: 31

COMMENTS:         FIRST CATALYST TEST  DUAL DIAPHRAGM EGR
                  ASHCROFT VALVE 1 STALL  3790 CC = 11.08 MPG.

                      *** TEST DATA ***

TEMP: 52   F (WET)                 PRES: 749.035  MM HG (BARO)
      70   F (DRY)                       13.765   MM HG (VAPOR)
      100   F (MIX)                      24.7625   IN. H20 (INLET)
RH:  25  %                               19.6   IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS              BLOWER SPEED:  3
FUEL: HO III                       CF/REV: .3006
BLOWER RPM (ACT): 928.425          BLOWER RPM (CAL): 928.525

                    BAG 1              BAG 2             BAG 3
                 AIR     EX         AIR      EX       AIR      EX

TIME (SECS)         505.1               868              506.6
BLOWER REVS         7817               13431             7838
CO   (PPM)       3.40   627.00      5.20     6.00     3.70     4.00
HC   (PPM C)    11.84   172.80     13.24    30.76    13.32    50.80
NOX  (PPM)       0.41    40.30      0.65    11.40     0.60    35.10
CO2  (%)         0.04     2.86      0.05     1.70     0.05     2.41

                  *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)        2048.57          3519.81          2054.07
DF               4.564            7.86546          5.5476

CORRECTED CONCENTRATIONS

NOX (PPM)         39.98            10.83            34.61
HC   (PPM C)     163.55            19.20            39.88
CO   (PPM)       584.78             1.25             0.77
CO2 (%)            2.83             1.66             2.37

MASS EMISSIONS   (GRAMS/BAG)

NOX                3.62             1.69             3.15
HC                 5.47             1.10             1.34
CO                39.50             0.15             0.05
CO2             3022.05          3040.37          2537.68

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.67
HC                 0.56
CO                 2.29
CO2              771.51

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.34
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346<

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                       ****** CVS 784 ******

                      *** IDENTIFICATION ***

TEST DATE: 2-9-76               ROAD TEST: NA
VEHICLE:  ETV 26                DRIVER: MIKE K
MATERIAL: GEM 68-PF/PG          TEST MILES: 71

COMMENTS:     ASHCROFT VALVE ADJ. TO OPERATE AT 10 INCH HG
              CHOKE LEANED OUT  10.62 MPG.

                        *** TEST DATA ***

TEMP: 53  F (WET)               PRES: 748.935  MM HG (BARO)
      73  F (DRY)                     20.815  MM HG (VAPOR)
      100  F (MIX)                    24.85  IN. H20 (INLET)
RH:  22  %                            19.6  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3007
BLOWER RPM (ACT): 928.528       BLOWER RPM (CAL): 928.516

                    BAG 1            BAG 2            BAG 3
                 AIR     EX       AIR     EX       AIR     EX

TIME (SECS)         506.8            867.9            506.6
BLOWER REVS         7842             13433            7839
CO  (PPM)        5.10  228.00     5.10     6.00    1.70     9.40
HC  (PPM C)     23.40  105.60    23.68    45.20   25.84    69.20
NOX (PPM)        0.55   46.80     0.77    11.40    0.71    36.70
CO2 (%)          0.04    2.94     0.05     1.82    0.04     2.48

                    *** CALCULATED RESULTS ***

                BAG 1            BAG 2            BAG 3

VMIX (CF)       2055.24          3520.53          2054.45
DF              4.50889          7.34208          5.38627

CORRECTED CONCENTRATIONS

NOX (PPM)         46.37            10.73            36.12
HC  (PPM C)       87.39            24.75            48.16
CO  (PPM)        209.54             1.37             7.51
CO2 (%)            2.91             1.78             2.45

MASS EMISSIONS  (GRAMS/BAG)

NOX                4.21             1.67             3.23
HC                 2.93             1.42             1.62
CO                14.20             0.16             0.51
CO2             3117.74          3262.14          2622.16

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.71
HC                 0.48
CO                 0.87
CO2              812.99

FUEL ECONOMY  (MILES/GAL)

EPAMPG            10.89
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                    ****** CVS 738 ******

                   *** IDENTIFICATION ***

TEST DATE: 2-10-76                 ROAD TEST: NA
VEHICLE:   ETV 26                  DRIVER: MIKE K
MATERIAL: GEM 68 PF/PG             TEST MILES: 82

COMMENTS:        MORE OR LESS A SET UP TEST TO SEE
                 WHATS-WHATS         3913CC = 10.73 MPG

                     *** TEST DATA ***

TEMP: 59   F (WET)                PRES: 732.585  MM HG (BARO)
      79   F (DRY)                      25.509  MM HG (VAPOR)
      100   F (MIX)                     24.4125  IN. H20 (INLET)
RH:  28  %                              19.1625  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3008
BLOWER RPM (ACT): 928.543         BLOWER RPM (CAL): 928.605

                  BAG 1            BAG 2            BAG 3
               AIR     EX       AIR     EX       AIR     EX

TIME (SECS)      507.1            867.8            506.5
BLOWER REVS      7847             13431            7838
CO  (PPM)     1.00  168.00     1.00     2.00    1.00     2.00
HC  (PPM C)  24.00  101.20    28.76    49.20   23.96    63.20
NOX (PPM)     0.50   50.40     0.83    11.30    0.46    35.60
CO2 (%)       0.04    3.23     0.05     1.86    0.04     2.52

                 *** CALCULATED RESULTS ***

               BAG 1            BAG 2            BAG 3

VMIX (CF)      2011.91          3443.6           2009.6
DF             4.11583          7.18455          5.30376

CORRECTED CONCENTRATIONS

NOX (PPM)       50.02            10.59            35.23
HC  (PPM C)     83.03            24.44            43.76
CO  (PPM)      155.28             1.06             1.03
CO2 (%)          3.20             1.82             2.49

MASS EMISSIONS  (GRAMS/BAG)

NOX              4.73             1.71             3.33
HC               2.73             1.37             1.44
CO              10.30             0.12             0.07
CO2           3357.17          3262.96          2606.96

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX              0.75
HC               0.45
CO               0.61
CO2            825.67

FUEL ECONOMY  (MILES/GAL)
                                            348<
EPAMPG          10.64
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                   ****** CVS 798 ******

                  *** IDENTIFICATION ***

TEST DATE: 2/18/76            ROAD TEST: NA
VEHICLE:  ETV 26              DRIVER: MIKE K
MATERIAL: GEM 68 PF/PG        TEST MILES: 136

COMMENTS:      SET UP TEST
               WEIGHTED FUEL=11.0MPG

                     *** TEST DATA ***

TEMP: 61  F (WET)             PRES: 729.135  MM HG (BARO)
      79  F (DRY)                   25.509  MM HG (VAPOR)
      100  F (MIX)                  24.15  IN. H2O (INLET)
RH:  34  %                          18.9875  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS         BLOWER SPEED:  3
FUEL: HO III                  CF/REV: .3005
BLOWER RPM (ACT): 928.612     BLOWER RPM (CAL): 928.649

                   BAG 1          BAG 2         BAG 3
                 AIR    EX      AIR    EX     AIR    EX

TIME (SECS)        508.2          868           505.9
BLOWER REVS        7866           13434         7829
CO   (PPM)     27.00  277.00   5.00    6.00   1.00   10.00
HC   (PPM C)   19.44   81.84  27.40   39.32  23.88   50.92
NOX (PPM)       0.74   36.46   0.67    9.97   0.47   30.47
CO2 (%)         0.06    2.91   0.05    1.79   0.05    2.48

                 *** CALCULATED RESULTS ***

               BAG 1          BAG 2          BAG 3

VMIX (CF)       2005.94       3425.86        1996.5
DF              4.55159       7.46724        5.39011

CORRECTED CONCENTRATIONS

NOX (PPM)        35.88           9.39          30.09
HC   (PPM C)     66.67          15.59          31.47
CO   (PPM)      237.60           1.44           8.61
CO2 (%)           2.86           1.74           2.44

MASS EMISSIONS  (GRAMS/BAG)

NOX               3.52           1.57           2.94
HC                2.18           0.37           1.03
CO               15.71           0.16           0.57
CO2            2995.17        3105.14        2539.72

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX               0.64
HC                0.32
CO                0.97
CO2             778.76

FUEL ECONOMY  (MILES/GAL)

EPAMPG           11.35
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                    ****** CVS 802 ******

                   *** IDENTIFICATION ***

TEST DATE: 2-19-76              ROAD TEST: NA
VEHICLE:   ETV 26               DRIVER: MIKE K
MATERIAL: GEM 68-PF/PG          TEST MILES: 148

COMMENTS:          RAN TEST TO SEE WERE CARB. WAS AT
                   11.13 MPG.

                      *** TEST DATA ***

TEMP: 57   F (WET)              PRES: 737.885  MM HG (BARO)
      79   F (DRY)                    25.509  MM HG (VAPOR)
      100  F (MIX)                    24.5  IN. H20 (INLET)
RH:  22  %                            19.25  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .3006
BLOWER RPM (ACT): 928.495       BLOWER RPM (CAL): 928.587

                     BAG 1           BAG 2           BAG 3
                   AIR    EX       AIR    EX       AIR    EX

TIME (SECS)          505.9           867.7           505.7
BLOWER REVS          7829            13427           7826
CO  (PPM)          1.00  185.00    1.00    2.00    1.00   11.00
HC  (PPM C)        9.08   70.00   10.68   25.36   13.36   38.08
NOX (PPM)          0.48   42.60    0.70   10.60    0.57   28.30
CO2 (%)            0.04    2.90    0.04    1.75    0.04    2.43

                  *** CALCULATED RESULTS ***

                  BAG 1           BAG 2           BAG 3

VMIX (CF)        2021.05         3466.16         2020.27
DF               4.58224         7.64523         5.50342

CORRECTED CONCENTRATIONS

NOX (PPM)          42.22            9.99           27.83
HC  (PPM C)        62.90           16.08           27.15
CO  (PPM)         172.58            1.06            9.59
CO2 (%)             2.87            1.72            2.40

MASS EMISSIONS  (GRAMS/BAG)

NOX                 3.86            1.57            2.55
HC                  2.08            0.91            0.90
CO                 11.50            0.12            0.64
CO2              3023.57         3100.46         2525.70

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                 0.62
HC                  0.31
CO                  0.72
CO2               778.70

FUEL ECONOMY  (MILES/GAL)

EPAMPG             11.35
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                    ****** CVS 811 ******

                   *** IDENTIFICATION ***

TEST DATE: 2-25-76                ROAD TEST: NA
VEHICLE:   ETV 26                 DRIVER: MIKE E
MATERIAL: GEM 68-PF/PG            TEST MILES: 177

COMMENTS:        TEST IS ONLY TOO CHECK OUT NEW CARB.
                 SOLID ANEROID CARB. NO. 7045202  11.80 MPG.

                      *** TEST DATA ***

TEMP: 56   F (WET)                PRES: 747.985  MM HG (BARO)
      75   F (DRY)                      22.243  MM HG (VAPOR)
     100   F (MIX)                      25.025  IN. H20 (INLET)
RH:  27  %                              19.775  IN. H20 (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .3012
BLOWER RPM (ACT): 928.422         BLOWER RPM (CAL): 928.481

                      BAG 1            BAG 2            BAG 3
                   AIR     EX       AIR     EX       AIR     EX

TIME (SECS)          504.5            868.4            505.9
BLOWER REVS          7805             13439            7828
CO  (PPM)         1.00  352.00    1.20    2.00    1.00     4.90
HC  (PPM C)       8.08   77.60   10.04   23.72   11.64    33.28
NOX (PPM)         0.54   29.60    0.64   12.00    0.52    26.20
CO2 (%)           0.04    2.75    0.04    1.54    0.04     2.35

                   *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)       2045.46          3521.96          2051.48
DF              4.80151          8.68683          5.69294

CORRECTED CONCENTRATIONS

NOX (PPM)         29.17            11.43            25.77
HC  (PPM C)       71.20            14.84            23.68
CO  (PPM)        329.51             0.87             3.82
CO2 (%)            2.72             1.50             2.32

MASS EMISSIONS  (GRAMS/BAG)

NOX                2.72             1.84             2.41
HC                 2.38             0.85             0.79
CO                22.22             0.10             0.26
CO2             2899.66          2763.51          2478.37

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.58
HC                 0.31
CO                 1.31
CO2              723.11

FUEL ECONOMY  (MILES/GAL)

EPAMPG            12.03
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                    ****** CVS 815 ******

                   *** IDENTIFICATION ***

TEST DATE: 2-27-76              ROAD TEST: NA
VEHICLE:   ETV 26               DRIVER: MIKE K
MATERIAL: GEM 68PF/PG           TEST MILES: 210

COMMENTS:         SECOND TEST TO VERIFY FIRST TEST WHICH
                  SHOWED INCREASED FUEL ECONOMY 3645CC=11.53 MPG

                     *** TEST DATA ***

TEMP: 57   F (WET)              PRES: 746.985  MM HG (BARO)
      77   F (DRY)                    23.756  MM HG (VAPOR)
      100  F (MIX)                    24.5  IN. H2O (INLET)
RH:  26  %                            19.25  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS           BLOWER SPEED:  3
FUEL: HO III                    CF/REV: .2999
BLOWER RPM (ACT): 928.483       BLOWER RPM (CAL): 928.587

                      BAG 1          BAG 2          BAG 3
                   AIR    EX      AIR    EX      AIR    EX

TIME (SECS)          506.8          867.2          506.1
BLOWER REVS          7842           13421          7831
CO  (PPM)         1.00  284.00   2.40    3.00   3.10  110.00
HC  (PPM C)      12.08   87.08  18.56   32.00  18.56   41.72
NOX (PPM)         0.46   30.15   0.60   10.57   0.49   20.73
CO2 (%)           0.05    2.95   0.05    1.61   0.06    2.40

                  *** CALCULATED RESULTS ***

                 BAG 1          BAG 2          BAG 3

VMIX (CF)       2046.15        3501.83        2043.28
DF              4.48873        8.30499        5.54964

CORRECTED CONCENTRATIONS

NOX (PPM)         29.79          10.04          20.33
HC  (PPM C)       77.69          15.67          26.50
CO  (PPM)        264.72           0.79         101.47
CO2 (%)            2.91           1.57           2.35

MASS EMISSIONS  (GRAMS/BAG)

NOX                2.79           1.61           1.90
HC                 2.60           0.90           0.88
CO                17.86           0.09           6.84
CO2             3106.38        2859.87        2504.95

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.52
HC                 0.34
CO                 1.56
CO2              749.79

FUEL ECONOMY  (MILES/GAL)

EPAMPG            11.53
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                    ****** CVS 865 ******

                   *** IDENTIFICATION ***

TEST DATE: 4-3-76                 ROAD TEST: NA
VEHICLE:   ETV 26                 DRIVER: MIKE K
MATERIAL: GEM NONE                TEST MILES: 35025

COMMENTS:        BASELINE TEST  NEW CARB.
                 3567  CC = 11.77 MPG.

                      *** TEST DATA ***

TEMP: 55   F (WET)                PRES: 747.235  MM HG (BARO)
      70   F (DRY)                       18.765  MM HG (VAPOR)
      100   F (MIX)                      23.7125  IN. H2O (INLET)
RH:  36  %                               18.8125  IN. H2O (OUTLET)
INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
FUEL: HO III                      CF/REV: .2982
BLOWER RPM (ACT): 928.576         BLOWER RPM (CAL): 928.71

                    BAG 1            BAG 2            BAG 3
                  AIR    EX        AIR    EX        AIR    EX

TIME (SECS)          505.4            367.1            506.7
BLOWER REVS          7823             13419            7841
CO  (PPM)         5.30 3500.00   25.20 1156.00   18.40 2900.00
HC  (PPM C)       7.28  257.36   11.00  160.68    9.52  229.83
NOX (PPM)         0.31   50.96    0.76   19.30    0.63   34.38
CO2 (%)           0.04    2.51    0.07    1.42    0.04    2.03

                  *** CALCULATED RESULTS ***

                 BAG 1            BAG 2            BAG 3

VMIX (CF)       2034.57          3490.12          2039.35
DF              4.67754          8.66101          5.75531

CORRECTED CONCENTRATIONS

NOX (PPM)         50.72            18.63            33.85
HC  (PPM C)      251.64           150.95           222.01
CO  (PPM)       3236.07          1088.93          2737.93
CO2 (%)            2.43             1.36             2.00

MASS EMISSIONS  (GRAMS/BAG)

NOX                4.79             3.02             3.21
HC                 8.36             8.60             7.39
CO               220.44           125.30           184.09
CO2             2629.94          2471.84          2123.80

WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

NOX                0.92
HC                 2.19
CO                43.34
CO2              641.77

FUEL ECONOMY  (MILES/GAL)

EPAMPG            12.11
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                    ****** CVS 868 ******

                   *** IDENTIFICATION ***

 TEST DATE: 4-6-76                 ROAD TEST: NA
 VEHICLE:   ETV 26                 DRIVER: MIKE K
 MATERIAL: GEM NONE                TEST MILES: NOT WORKING

 COMMENTS:         3 RD BASELINE TEST - NO CAT
                   GOOD STARTS             3659CC = 11.48 M.P.G.

                      *** TEST DATA ***

 TEMP: 56   F (WET)                PRES: 743.085  MM HG (BARO)
       70   F (DRY)                      18.765  MM HG (VAPOR)
       100   F  (MIX)                     24.0625  IN. H20 (INLET)
 RH:  40  %                              18.9875  IN. H20 (OUTLET)
 INERTIA WT.: 4000 LBS             BLOWER SPEED:  3
 FUEL: HO III                      CF/REV: .2993
 BLOWER RPM (ACT): 928.628         BLOWER RPM (CAL): 928.657

                    BAG 1          BAG 2          BAG 3
                 AIR    EX      AIR    EX      AIR    EX

 TIME (SECS)        506.4          868.1          505.5
 BLOWER REVS        7340           13433          7824
 CO   (PPM)     17.00 3950.00  46.60 1190.00  29.40 3100.00
 HC   (PPM C)    5.52  258.20  10.12  159.28  10.04  228.16
 NOX (PPM)       0.35   48.54   1.10   18.30   0.58   35.21
 CO2 (%)         0.05    2.53   0.07    1.39   0.07    2.09

                  *** CALCULATED RESULTS ***

                  BAG 1          BAG 2          BAG 3

 VMIX (CF)       2032.24        3482.02        2028.09
 DF              4.57388        8.81459        5.56863

 CORRECTED CONCENTRATIONS

 NOX (PPM)         48.27          17.32          34.73
 HC   (PPM C)     253.39         150.31         219.92
 CO   (PPM)      3693.48        1102.00        2911.42
 CO2 (%)            2.49           1.33           2.03

 MASS EMISSIONS  (GRAMS/BAG)

 NOX                4.64           2.86           3.34
 HC                 8.43           8.55           7.28
 CO               247.47         126.51         194.68
 CO2             2639.90        2411.37        2149.74

 WEIGHTED MASS EMISSIONS  (GRAMS/MILE)

 NOX                0.90
 HC                 2.18
 CO                45.85
 CO2              636.25

 FUEL ECONOMY  (MILES/GAL)

 EPAMPG            12.05
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                    ****** REPORT NO. 47 ******

                     *** IDENTIFICATION ***

DATE:7-1-75                         TIME 1:51:10
VEHICLE:  EIV 26                    DRIVER:LAMBI
MATERIAL: GPM BASELINE              TEST MILES:2222

COMMENTS:       5.875-4.115=1.760 = 16.28 MPG
                CAR IS STOCK

                         *** TEST DATA ****

TEMP: 74 F (WET)                    PRES: 751.775 MM HG (BARO)
   .   82 F (DRY)                          24.7657 IN. H20 (INLET)
      100 F (MIX)                          17.5125 IN. H20 (OUTLET)
RH: 78 %                            BLOWER SPEED: 3
INERTIA WT.:4000 LBS                BLOWER RPM (CAL): 928.142
FUEL:HO III                         BLOWER RPM (ACT): 928.540
                                    CF/REV: .2347

                      BAG
 .                 AIR       EX

TIME (SECS)             765
BLOWER REVS            11839
CO (PPM)           1.00      2.00
HC (PPM C)        14.00     30.36
CO2 (%)            0.06      3.83

                   *** CALCULATED RESULTS ***

VMIX (CF)         3055.47
DF                3.49576

MASS EMISSIONS (GRAMS/MILE)

HC                   0.093
CO                   0.011
CO2                585.803

FUEL ECONOMY  (MILES/GAL)

EPAMPG           15.14
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                    ****** REPT NO. 105 ******

                    *** IDENTIFICATION ***

DATE:7-16-75                          ROAD TEST:NA
VEHICLE:  EIV 26                      DRIVER:LARRY
MATERIAL: GEM NONE                    TEST MILES:3112

COMMENTS:          5915 - 4250 = 1665 = 17.22 MPG
                   BASELINE TEST

                       *** TEST DATA ****

TEMP: 72 F (WET)                      PRES: 750.985 MM HG (BARO)
      88 F (DRY)                            24.2603 IN. H2O (INLET)
      100 F (MIX)                           18.9875 IN. H2O (OUTLET)
RH: 46 %                              BLOWER SPEED: 3
INERTIA WT.:4000 LBS                  BLOWER RPM (CAL): 928.638
FUEL:HO III                           BLOWER RPM (ACT): 928.499
                                      CF/REV: .2989

                        BAG
                    AIR      EX

TIME (SECS)            765.3
BLOWER REVS            11843
CO (PPM)            1.00     2.00
HC (PPM C)          6.88     29.20
CO2 (%)             0.03     3.64

                    *** CALCULATED RESULTS ***

VMIX (CF)          3101.25
DF                 3.67818

MASS EMISSIONS (GRAMS/MILE)

HC                    0.120
CO                    0.011
CO2                 568.051

FUEL ECONOMY  (MILES/GAL)

EPAMPG            15.61
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                    ****** HWFET NO. 104 ******

                     *** IDENTIFICATION ***

DATE: 7-15-75                        ROAD TEST:NA
VEHICLE:  ETV 26                     DRIVER:LARRY
MATERIAL: GEM NONE                   TEST MILES:3087

COMMENTS:         6000 - 4325 = 1675 = 17.1 MPG
                  BASELINE GOOD RUN

                         *** TEST DATA ****

TEMP: 67 F (WET)                     PRES: 751.455 MM HG (BARO)
      84 F (DRY)                           24.5972 IN. H2O (INLET)
      100 F (MIX)                          19.075 IN. H2O (OUTLET)
RH: 40 %                             BLOWER SPEED: 3
INERTIA WT.:4000 LBS                 BLOWER RPM (CAL): 928.595
FUEL:HO III                          BLOWER RPM (ACT): 928.113
                                     CF/REV: .2995

                      BAG
                  AIR      EX

TIME (SECS)          766.2
BLOWER REVS          11858
CO (PPM)          1.00     2.00
HC (PPM C)        7.04    30.60
CO2 (%)           0.05     3.58

                  *** CALCULATED RESULTS ***

VMIX (CF)        3108.59
DF               3.73963

MASS EMISSIONS (GRAMS/MILE)

HC                 0.126
CO                 0.011
CO2              557.627

FUEL ECONOMY  (MILES/GAL)

EPAMPG           15.90
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                 ****** HWFET NO. 134 ******

                   *** IDENTIFICATION ***

DATE: 11-12-75                     ROAD TEST:NA
VEHICLE:   ETV 26                  DRIVER:MIKE K
MATERIAL:  GEM NONE                TEST MILES:1012

COMMENTS:        BASELINE - STOCK EVERYTHING  THIS IS ALSO A PREP.
                 FOR A CVS ON 11-13-75  2391 CC= 16.19 MPG.

                       *** TEST DATA ****

TEMP:  61 F (WET)                  PRES: 738.185 MM HG (BARO)
       78 F (DRY)                        24.4287 IN. H2O (INLET)
      100 F (MIX)                        19.25 IN. H2O (OUTLET)
RH:  34 %                          BLOWER SPEED: 3
INERTIA WT.:4000 LBS               BLOWER RPM (CAL): 928.594
FUEL:HO III                        BLOWER RPM (ACT): 939.424
                                   CF/REV: .3005

                         BAG
                    AIR       EX

TIME (SECS)              756.4
BLOWER REVS             11843
CO (PPM)           19.50    26.40
HC (PPM C)          8.80    32.72
CO2 (%)             0.04     3.58

                 *** CALCULATED RESULTS ***

VMIX (CF)          3059.56
DF                 3.7 3707

MASS EMISSIONS (G RAMS/MILE)

HC                    0.128
CO                    0.100
CO2                 549.968

FUEL ECONOMY  (MILES/GAL)

EPAMPG             16.12
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                   ****** HWFET NO. 136 ******

                      *** IDENTIFICATION ***

DATE:11/14/75                     ROAD TEST:NA
VEHICLE:  ETV 26                  DRIVER:MIKE K
MATERIAL: GEM NONE                TEST MILES:3203

COMMENTS:       STO CK EVERYTHING
                BASELINE TEST  FUEL 2338CC

                         *** TEST DATA ****

TEMP: 54 F (W ET)                  PRES: 739.185 MM HG (BARO)
      73 F (DRY)                        24.7657 IN. H20 (INLET)
     103 F (MIX)                        19.075 IN. H20 (OUTLET)
RH: 25 %                          BLOWER SPEED: 3
INERTIA WT.:4000 LBS              BLOWER RPM (CAL): 928.578
FUEL:HO III                       BLOWER RPM (ACT): 928.383
                                  CF/REV: .3007

                      BAG
                  AIR      EX

TIME (SECS)           766.3
BLOWER REVS           11857
CO (PPM)         10.00    20.00
HC (PPM C)        7.00     31.72
CO2 (%)           0.03     3.49

                   *** CALCULATED RESULTS ***

VMIX (CF)        3050.25
DF               3.83403

MASS EMISSIONS (GRAMS/MILE)

HC                  0.129
CO                  0.110
CO2               534.926

FUEL EMONOMY  (MILES/G AL)

EPAMPG          16.57

RUNNING TIME: 1.6 UNITS
READY
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                 ****** HWFET NO. 167 ******

                  *** IDENTIFICATION ***

DATE:2-6-76                   ROAD TEST:NA
VEHICLE:  ETV 26              DRIVER:NA
MATERIAL: GEM 68 PF/PC        TEST MILES:53

COMMENTS:      CHECK TEST          2399CC = 16.13 M.P.G.
               FIRST HWFET IN CATALYST CALIBRATION

                       *** TEST DATA ****

TEMP: 53 F (WET)              PRES: 748.935 MM HG (BARO)
      73 F (DRY)                    24.4287 IN. H20 (INLET)
      100 F (MIX)                   19.6 IN. H20 (OUTLET)
RH: 22 %                      BLOWER SPEED: 3
INERTIA WT.:4000 LBS          BLOWER RPM (CAL): 928.559
FUEL:HO III                   BLOWER RPM (ACT): 928.471
                              CF/REV: .3001

                      BAG
                  AIR      EX

TIME (SECS)          765
BLOWER REVS         11838
CO (PPM)          5.70    6.00
HC (PPM C)       15.40   33.44
CO2 (%)           0.04    3.51

                 *** CALCULATED RESULTS ***

VMIX (CF)        3101.6
DF               3.81343

MASS EMISSIONS (GRAMS/MILE)

HC                 0.109
CO                 0.014
CO2              546.500

FUEL ECONOMY  (MILES/GAL)

EPAMPG          16.23

RUNNING TIME: 1.6 UNITS
READY

BYE
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                 ****** HWFET NO. 173 ******

                  *** IDENTIFICATION ***

DATE:2-25-76                  ROAD TEST:NA
VEHICLE:   ETV 26             DRIVER:MIKE E
MATERIAL: GEM 68 PF/PG        TEST MILES:199

COMMENTS:      ONLY CHANGE IS A NEW CARBURETOR - SET OP SAME
               AS OTHERS - SOLID ANEROID  CARB #7045202 2450 CC = 15.30
MPG

                       *** TEST DATA ****

TEMP: 57 F (WET)              PRES: 746.585 MM HG (BARO)
      78 F (DRY)                    24.3445 IN. H20 (INLET)
      100 F (MIX)                   19.25 IN. H20 (OUTLET)
RH: 24 %                      BLOWER SPEED: 3
INERTIA WT.:4000 LBS          BLOWER RPM (CAL): 928.603
FUEL:HO III                   BLOWER RPM (ACT): 928.414
                              CF/REV: .2997

                      BAG
                  AIR     EX

TIME (SECS)          764.4
BLOWER REVS         11828
CO (PPM)         7.00    3.00
HC (PPM C)      21.20   29.43
CO2 (%)          0.04    3.63

                 *** CALCULATED RESULTS ***

VMIX (CF)       3085.45
DF              3.68772

MASS EMISSIONS (GRAMS/MILE)

HC                0.069
CO                0.023
CO2             562.454

FUEL ECONOMY  (MILES/GAL)

EPAMPG         15.77

RUNNING TIME: 1.6 UNITS
READY
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BYE

APPENDIX 5

CONTRACT SCOPE OF WORK

EXHIBIT A
SCOPE OF WORK
CONTRACT 68-03-2161

The contractor shall provide all of the necessary personnel, facilities and equipment to perform the following tasks.

Task I Vehicle Selection, Procurement and Initial Testing

The contractor shall procure three nominally identical vehicles for the purposes of modification and testing. The vehicle type shall be a 5-6 passenger domestic sedan in the 3000 to 4000 pound inertia weight class range. The project officer must approve the vehicle selection prior to vehicle procurement. The vehicle selection and procurement part of this task is expected to be completed quickly, since a discussion of the candidate vehicles, reasons for their selection, and an indication of how the vehicle type selected and proposed by the bidder will interface with the proposed system must be a part of the proposal.

After procurement the contractor shall conduct tests to verify that the vehicles are set up and operating correctly and that no vehicle is defective.

The contractor shall also run baseline emission and fuel economy tests on the new vehicles, tuned to manufacturers specification. Three 1975 FTP tests (w/o evap) and three non-metropolitan ("highway") tests on each vehicle shall be run.

Task 2 Vehicle Modification

The contractor shall modify the vehicles by installing the emission control system as described in the proposal. This task is expected to be able to be done in an efficient and rapid manner, since the bidders must show in the proposal that they understand exactly what system will be installed, what parts and components will be used and also must show that the componentry is readily available or is on hand already. Delays in the build-up of the vehicles due to parts availability are not desirable.

The vehicles shall also be modified in such a way that continuous traces of HC, CO, CO_2 and NO_x can be generated corresponding to concentrations at significant physical locations for these sampling points and recommendations for the locations and the number of sampling points should be included in the proposal.

Task 3 Vehicle Calibration/Optimization

The contractor, after system installation, shall calibrate the vehicles to the optimum for the purposes of running durability. This for example would involve, exhaust CO/O2 ratio setting, spark timing and advance, fuel enrichment metering, air injection rates and control, EGR flowrate and control, etc. The agency considers that this task should be also capable of being conducted in an efficient manner, because the contractor must have demonstrated capability to do this type of system optimization in the proposal, and, indeed must show that he understands what (within reasonable tolerances) he wants the calibration to be.

At the completion of the calibration, the contractor shall run three 1975 FTP tests (w/evap) and three "highway" cycles on each vehicle. These will be considered as the "zero mile" data.

Task 4 Durability Testing

Based on the results of Task 3, the contractor shall modify as necessary, subject to project officer approval, the durability test plan described in the proposal. This durability test plan submitted with the proposal shall include a description of the test facilities to be used, the location of the facilities, and their availability for the testing. Also included shall be estimates of the fuel used, its availability and composition, the spare parts that will be on hand and the estimated type and frequency of maintenance to be performed as "scheduled." Maintenance items and spare parts estimates are important. The agency does not want vehicles delayed for lack of parts and maintenance items. The contractor shall endeavor to have adequate supplies on hand. Previous durability experience with similar systems, is of course desirable, because projections of items like air pumps, for example, can be made based on experience.

After modification of the durability test plan the contractor shall conduct durability testing on the vehicles as described in the Federal Register, the so called AMA durability test schedule.

The contractor shall run two 1975 FTP tests (w/evap) at each 5000 mile interval. Additionally two "highway" tests will also be performed at each test point with the project officer reserving the right to delete the "highway" testing during the mileage accumulation if the contractor suggests it and no more important data are being generated.

The contractor shall complete 50,000 miles of durability testing on each vehicle unless directed to do otherwise by the project officer. The vehicles may be tested at the EPA laboratory at selected mileage intervals, for example at 25,000 miles and/or 50,000 miles. This confirmatory testing will depend on the location of the contractors test facilities and the test results. These tests will be conducted at the project officer's discretion, and test plans in the proposals shall reflect the cost and time for these tests as a separate item.

The contractor shall complete a detailed log book for each vehicle. This log book shall include a detailed description of the test vehicle and its history during the program. These log books, which shall be included as appendixes to the final report shall include everything that was done to each vehicle. All fuel, oil, water, etc. shall be logged in along with all maintenance items, including those done to the vehicle that may not be thought to affect durability. Examples would be replacing tires, lights, brake pads, etc. The agency wants to have a record of everything that was done to each vehicle. A proposed format for the log book shall be included in the proposal.

The agency realizes that durability tests of this nature are not without problems, especially with respect to unscheduled maintenance. However, any maintenance to be done to the emission control system other than that in the durability test plan must be approved by the project officer.

After completion of the durability testing the contractor shall compute deterioration factors for HC, CO and NO_x for each vehicle. These shall be included along with a listing of every emission measurement. 1975 FTP test, diagnostic test, continuous test, and "highway" test, for each vehicle as appendixes in the final report.

Task 5 Plans and Recommendations for Future Work

Based on the results of the testing, the contractor shall prepare a plan for future work (if any) needed to resolve any problems discovered during this contract or to further improve the NO_x emission control and/or fuel economy of systems employing catalytic control of NO_x.